1957–1958

# RYERSON STEEL

**ALUMINUM & STEEL IN STOCK**

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Plant: 500 S. 88th St., Milwaukee

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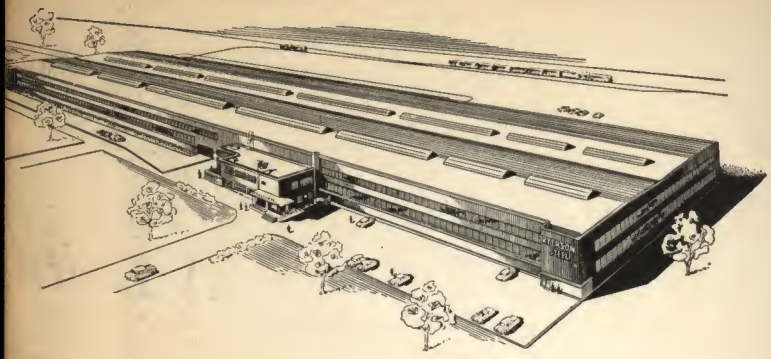

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**JOSEPH T. RYERSON & SON, INC.**

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# BUYING DATA

This book contains information on practically every type of steel and aluminum used today—including sizes in stock and necessary weights, dimensions and descriptive data.

To help you figure prices, a convenient pocket in the back is designed to contain Base Prices, Extras and Cutting Charges.*

Within these red covers, we've tried to combine for you most all the basic information needed to purchase steel of every kind. We hope you'll continue to find this book a handy, reliable guide to steel for immediate shipment.

* If current prices are not in your book, we'll gladly send them to you. Or contact us any time for pricing or other information.

# PERSONAL SERVICE

If you need more specific information—what kind of steel to use for a certain job, or how to form, fabricate, heat treat or machine a particular steel—please call us. Our metallurgists, engineers and experienced steel men will give prompt, personal attention to your every question.

We urge you to take advantage of these men whenever you have occasion for special help on steel problems.

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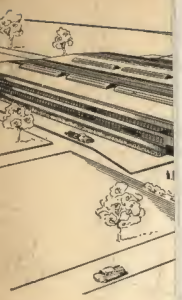

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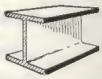
A.S.T.M.—A7-53T for bridges & buildings
Tensile Strength 60,000 to 72,000 psi

| Size in Inches | Wt. per Ft. in Lbs. | Thickness of Web in Inches | Width of Flange in Inches | Stock Lengths in Feet |
|---|---|---|---|---|
| 3 | 5.7 | 0.170 | 2.330 | 40* |
| | 7.5 | 0.349 | 2.509 | 40* |
| 4 | 7.7 | 0.190 | 2.660 | 40* |
| | 9.5 | 0.326 | 2.796 | 40* |
| 5 | 10.0 | 0.210 | 3.000 | 55/60* |
| | 14.75 | 0.494 | 3.284 | 55/60* |
| 6 | 12.5 | 0.230 | 3.330 | 55/60* |
| | 17.25 | 0.465 | 3.565 | 55/60* |
| 7 | 15.3 | 0.250 | 3.660 | 55/60* |
| | 20.0 | 0.450 | 3.860 | 55/60* |
| 8 | 18.4 | 0.270 | 4.000 | 55/60* |
| | 23.0 | 0.441 | 4.171 | 55/60* |
| 10 | 25.4 | 0.310 | 4.660 | 55/60* |
| | 35.0 | 0.594 | 4.944 | 55/60* |
| 12 | 31.8 | 0.350 | 5.000 | 55/60* |
| | 35.0 | 0.428 | 5.078 | 55/60* |
| | 40.8 | 0.460 | 5.250 | 55/60* |
| | 50.0 | 0.687 | 5.477 | 55/60* |
| 15 | 42.9 | 0.410 | 5.500 | 55/60 |
| | 50.0 | 0.550 | 5.640 | 55/60 |
| 18 | 54.7 | 0.460 | 6.000 | 55/60 |
| | 70.0 | 0.711 | 6.251 | 55/60 |
| 20 | 65.4 | 0.500 | 6.250 | 55/60 |
| 24 | 79.9 | 0.500 | 7.000 | 55/60 |
| | 100.0 | 0.747 | 7.247 | 55/60 |
| | 105.9 | 0.625 | 7.875 | 55/60 |

## WIDE FLANGE BEAMS • "H" Beams

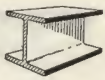


A.S.T.M.—A7-53T for bridges & buildings
Tensile Strength 60,000 to 72,000 psi

| Section & Size in Inches | Wt. per Ft. in Lbs. | Depth of Section in Inches | Flange in Inches | | Web Thickness in Inches | Stock Lgths. in Ft. |
|---|---|---|---|---|---|---|
| | | | Width | Thickness | | |
| 4x 4 H | 13.0 | 4.00 | 3.937 | .375 | .280 | 40* |
| 5x 5 H | 18.9 | 5.00 | 5.000 | .483 | .313 | 40* |
| 6x 4 | 8.5 | 5.83 | 3.940 | .194 | .170 | 40* |
| | 12.0 | 6.00 | 4.000 | .279 | .230 | 40* |
| | 16.0 | 6.25 | 4.030 | .404 | .260 | 40* |
| 6x 6 | 15.5 | 6.00 | 6.000 | .269 | .240 | 40* |
| H | 20.0 | 6.00 | 5.938 | .375 | .258 | 40* |
| H | 25.0 | 6.37 | 5.938 | .500 | .320 | 40* |
| 8x 4 | 10.0 | 7.90 | 3.940 | .204 | .170 | 40* |
| | 13.0 | 8.00 | 4.000 | .254 | .230 | 40* |
| | 15.0 | 8.12 | 4.015 | .314 | .245 | 40* |
| 8x 5¼ | 17.0 | 8.00 | 5.250 | .308 | .230 | 40* |
| | 20.0 | 8.14 | 5.268 | .378 | .248 | 40* |
| 8x 6½ | 24.0 | 7.93 | 6.500 | .398 | .245 | 40* |
| | 28.0 | 8.06 | 6.540 | .463 | .285 | 40* |
| 8x 8 H | 31.0 | 8.00 | 8.000 | .433 | .288 | 40* |
| H | 34.3 | 8.00 | 8.000 | .375 | .375 | 40* |
| | 35.0 | 8.12 | 8.027 | .493 | .315 | 40* |
| | 40.0 | 8.25 | 8.077 | .558 | .365 | 40* |
| | 48.0 | 8.50 | 8.117 | .683 | .405 | 40* |
| | 58.0 | 8.75 | 8.222 | .808 | .510 | 40* |
| (Cont'd) | 67.0 | 9.00 | 8.287 | .933 | .575 | 40* |

* Stock Lengths include 20', 30' and 40'.

## WIDE FLANGE BEAMS



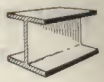
A.S.T.M.—A7-53T for bridges & buildings

Tensile Strength 60,000 to 72,000 psi

| Section & Size in Inches | Wt. per Ft. in Lbs. | Depth of Section in Inches | Flange in Inches | | Web Thickness in Inches | Stock Lgths. in Ft. |
|---|---|---|---|---|---|---|
| | | | Width | Thickness | | |
| *(Continued)* | | | | | | |
| 10x 4 | 11.5 | 9.87 | 3.950 | .204 | .180 | 55/60* |
| | 15.0 | 10.00 | 4.000 | .269 | .230 | 55/60* |
| | 17.0 | 10.12 | 4.010 | .329 | .240 | 55/60* |
| | 19.0 | 10.25 | 4.020 | .394 | .250 | 55/60* |
| 10x 5¾ | 21.0 | 9.90 | 5.750 | .340 | .240 | 55/60* |
| | 25.0 | 10.08 | 5.762 | .430 | .252 | 55/60* |
| | 29.0 | 10.22 | 5.799 | .500 | .289 | 55/60* |
| 10x 8 | 33.0 | 9.75 | 7.964 | .433 | .292 | 55/60* |
| | 39.0 | 9.94 | 7.990 | .528 | .318 | 55/60* |
| | 45.0 | 10.12 | 8.022 | .618 | .350 | 55/60* |
| 10x10 | 49.0 | 10.00 | 10.000 | .558 | .340 | 55/60* |
| | 60.0 | 10.25 | 10.075 | .683 | .415 | 55/60* |
| | 66.0 | 10.38 | 10.117 | .748 | .457 | 55/60* |
| | 72.0 | 10.50 | 10.170 | .808 | .510 | 55/60* |
| | 77.0 | 10.62 | 10.195 | .868 | .535 | 55/60* |
| | 89.0 | 10.88 | 10.275 | .998 | .615 | 55/60* |
| | 100.0 | 11.12 | 10.345 | 1.118 | .685 | 55/60* |
| 12x 4 | 14.0 | 11.91 | 3.970 | .224 | .200 | 55/60* |
| | 16.5 | 12.00 | 4.000 | .269 | .230 | 55/60* |
| | 19.0 | 12.16 | 4.010 | .349 | .240 | 55/60* |
| | 22.0 | 12.31 | 4.030 | .424 | .260 | 55/60* |
| 12x 6½ | 27.0 | 11.96 | 6.500 | .400 | .240 | 55/60* |
| | 31.0 | 12.09 | 6.525 | .465 | .265 | 55/60* |
| | 36.0 | 12.24 | 6.565 | .540 | .305 | 55/60* |
| 12x 8 | 40.0 | 11.94 | 8.000 | .516 | .294 | 55/60* |
| | 45.0 | 12.06 | 8.042 | .576 | .336 | 55/60* |
| | 50.0 | 12.19 | 8.077 | .641 | .371 | 55/60* |
| 12x10 | 53.0 | 12.06 | 10.000 | .576 | .345 | 55/60* |
| | 58.0 | 12.19 | 10.014 | .641 | .359 | 55/60* |
| 12x12 | 65.0 | 12.12 | 12.000 | .606 | .390 | 55/60* |
| | 72.0 | 12.25 | 12.040 | .671 | .430 | 55/60* |
| | 79.0 | 12.38 | 12.080 | .736 | .470 | 55/60* |
| 14x 6¾ | 30.0 | 13.86 | 6.733 | .383 | .270 | 55/60 |
| | 34.0 | 14.00 | 6.750 | .453 | .287 | 55/60 |
| | 38.0 | 14.12 | 6.776 | .513 | .313 | 55/60 |
| 14x 8 | 43.0 | 13.68 | 8.000 | .528 | .308 | 55/60 |
| | 48.0 | 13.81 | 8.031 | .593 | .339 | 55/60 |
| | 53.0 | 13.94 | 8.062 | .658 | .370 | 55/60 |
| 14x10 | 61.0 | 13.91 | 10.000 | .643 | .378 | 55/60 |
| | 74.0 | 14.19 | 10.072 | .783 | .450 | 55/60 |
| 14x12 | 78.0 | 14.06 | 12.000 | .718 | .428 | 55/60 |
| 14x14½ | 87.0 | 14.00 | 14.500 | .687 | .420 | 55/60 |
| 16x 7 | 36.0 | 15.85 | 6.992 | .428 | .299 | 55/60 |
| | 40.0 | 16.00 | 7.000 | .503 | .307 | 55/60 |
| | 45.0 | 16.12 | 7.039 | .563 | .346 | 55/60 |
| | 50.0 | 16.25 | 7.073 | .628 | .380 | 55/60 |
| *(Continued)* | | | | | | |

* Stock lengths also include 20′, 30′ and 40′.

## WIDE FLANGE BEAMS



A.S.T.M.—A7-53T for bridges & buildings
Tensile Strength 60,000 to 72,000 psi

| Section & Size in Inches | Wt. per Ft. in Lbs. | Depth of Section in Inches | Flange in Inches | | Web Thickness in Inches | Stock Lgths. in Ft. |
|---|---|---|---|---|---|---|
| | | | Width | Thickness | | |
| *(Continued)* | | | | | | |
| 16x 8½ | 58.0 | 15.86 | 8.464 | .645 | .407 | 55/60 |
| | 64.0 | 16.00 | 8.500 | .715 | .443 | 55/60 |
| 16x11½ | 88.0 | 16.16 | 11.502 | .795 | .504 | 55/60 |
| 18x 7½ | 50.0 | 18.00 | 7.500 | .570 | .358 | 55/60 |
| | 55.0 | 18.12 | 7.532 | .630 | .390 | 55/60 |
| 18x 8¾ | 64.0 | 17.87 | 8.715 | .686 | .403 | 55/60 |
| | 70.0 | 18.00 | 8.750 | .751 | .438 | 55/60 |
| | 77.0 | 18.16 | 8.787 | .831 | .475 | 55/60 |
| 18x11¾ | 96.0 | 18.16 | 11.750 | .831 | .512 | 55/60 |
| 21x 8¼ | 62.0 | 20.99 | 8.240 | .615 | .400 | 55/60 |
| | 68.0 | 21.13 | 8.270 | .685 | .430 | 55/60 |
| 21x13 | 112.0 | 21.00 | 13.000 | .865 | .527 | 55/60 |
| 24x 9 | 76.0 | 23.91 | 8.985 | .682 | .440 | 55/60 |
| | 84.0 | 24.09 | 9.015 | .772 | .470 | 55/60 |
| | 94.0 | 24.29 | 9.061 | .872 | .516 | 55/60 |
| 24x12 | 100.0 | 24.00 | 12.000 | .775 | .468 | 55/60 |

**Special Sections**—When you need a special Wide Flange or "H" Beam—different from those listed above—call us! We can furnish many additional sections and always invite your orders and inquiries.

## JUNIOR BEAMS *(Copper Bearing Quality)*

A.S.T.M.—A7-53T for bridges & buildings
Tensile Strength 60,000 to 72,000 psi

Junior Beams are widely used in schools, stores, apartments, residences and other light occupancy structures. Their success is based on simplicity of design and ease of installation, plus light weight and overall economy.

*For Junior Channels (Stair Stringer Channels), see page 12*

| Size in Inches | Wt. per Ft. in Lbs. | Width of Flange in Inches | Thickness of Web in Inches | Area Sq. Inches | Stock Lengths in Feet |
|---|---|---|---|---|---|
| 6 | 4.4 | 1.84 | .114 | 1.30 | 40 |
| 8 | 6.5 | 2.28 | .135 | 1.92 | 40 |
| 10 | 9.0 | 2.69 | .155 | 2.64 | 40 |

## CHANNELS — Bar Size

**AISI C 1020—Hot Rolled—Open Hearth**

| Size in Inches | Weight in Pounds Per Ft. | Weight in Pounds 20 Ft. Bar | Lengths in Feet |
|---|---|---|---|
| ¾ x 5/16 x 1/8 | .50 | 10.00 | 20 |
| ¾ x ⅜ x No. 15 | .40 | 8.00 | 20 |
| ¾ x ⅜ x 1/8 | .54 | 10.80 | 20 |
| ⅞ x ⅜ x 1/8 | .61 | 12.20 | 20 |
| ⅞ x 7/16 x 1/8 | .69 | 13.80 | 20 |
| 1 x ⅜ x 1/8 | .68 | 13.60 | 20 |
| 1 x ½ x 1/8 | .80 | 16.00 | 20,40 |
| 1 1/8 x 9/16 x 3/16 | 1.16 | 23.20 | 20 |
| 1 ¼ x ½ x 1/8 | 1.00 | 20.00 | 20 |
| 1 ½ x ½ x 1/8 | 1.04 | 20.80 | 20 |
| 1 ½ x 9/16 x 3/16 | 1.36 | 27.20 | 20 |
| 1 ½ x ¾ x 1/8 | 1.17 | 23.40 | 20 |
| 1 ½ x 1 ½ x 3/16 | 2.65 | 53.00 | 20 |
| 1 ¾ x ½ x 3/16 | 1.55 | 31.00 | 20 |
| 2 x ½ x 1/8 | 1.34 | 26.80 | 20 |
| 2 x 9/16 x 3/16 | 1.76 | 35.20 | 20 |
| 2 x ⅝ x ¼ | 2.18 | 43.60 | 20 |
| 2 x 1 x 1/8 | 1.78 | 35.60 | 20 |
| 2 x 1 x 3/16 | 2.59 | 51.80 | 20 |
| 2 ½ x ⅝ x 3/16 | 2.27 | 45.40 | 20 |

## CHANNELS — Structural

A.S.T.M.—A7-53T for bridges & buildings
Tensile Strength 60,000 to 72,000 psi

| Depth of Channel in Inches | Wt. per Ft. in Lbs. | Thickness of Web in Inches | Width of Flange in Inches | Stock Length in Feet |
|---|---|---|---|---|
| 3 | 4.1 | 0.170 | 1.410 | 40 |
| | 5.0 | 0.258 | 1.498 | 40* |
| | 6.0 | 0.356 | 1.596 | 40* |
| 4 | 5.4 | 0.180 | 1.580 | 40* |
| | 7.25 | 0.320 | 1.720 | 40* |
| 5 | 6.7 | 0.190 | 1.750 | 55/60* |
| | 9.0 | 0.325 | 1.885 | 55/60* |
| 6 | 8.2 | 0.200 | 1.920 | 55/60* |
| | 10.5 | 0.314 | 2.034 | 55/60* |
| | 13.0 | 0.437 | 2.157 | 55/60* |
| 7 | 9.8 | 0.210 | 2.090 | 55/60* |
| | 12.25 | 0.314 | 2.194 | 55/60* |
| | 14.75 | 0.419 | 2.299 | 55/60* |
| 8 | 11.5 | 0.220 | 2.260 | 55/60* |
| | 13.75 | 0.303 | 2.343 | 55/60* |
| | 18.75 | 0.487 | 2.527 | 55/60* |
| 9 | 13.4 | 0.230 | 2.430 | 55/60* |
| | 15.0 | 0.285 | 2.485 | 55/60* |
| | 20.0 | 0.448 | 2.648 | 55/60* |
| 10 | 15.3 | 0.240 | 2.600 | 55/60* |
| | 20.0 | 0.379 | 2.739 | 55/60* |
| | 25.0 | 0.526 | 2.886 | 55/60* |
| | 30.0 | 0.673 | 3.033 | 55/60* |
| 12 | 20.7 | 0.280 | 2.940 | 55/60* |
| | 25.0 | 0.387 | 3.047 | 55/60* |
| | 30.0 | 0.510 | 3.170 | 55/60* |
| 13 | 31.8 | 0.375 | 4.000 | 55/60 |
| | 50.0 | 0.787 | 4.412 | 55/60 |
| 15 | 33.9 | 0.400 | 3.400 | 55/60 |
| | 40.0 | 0.520 | 3.520 | 55/60 |
| | 50.0 | 0.716 | 3.716 | 55/60 |

* Stock lengths also include 20', 30' and 40'.

## SHIP AND CAR CHANNELS

A.S.T.M.—A7-53T for bridges & buildings

Tensile Strength 60,000 to 72,000 psi

| Depth of Channel in Inches | Wt. per Ft. in Lbs. | Thickness of Web in Inches | Width of Flange in Inches | Stock Lengths in Feet |
|---|---|---|---|---|
| **3** | 7.1 | .313 | 1.938 | 40* |
| **4** | 13.8 | .500 | 2.500 | 40* |
| **6** | 12.0 | .313 | 2.500 | 40* |
| | 15.3 | .340 | 3.500 | 55/60* |
| | 16.3 | .375 | 3.000 | 40* |
| | 18.0 | .375 | 3.500 | 40* |
| **7** | 19.1 | .350 | 3.450 | 55/60* |
| | 22.7 | .500 | 3.600 | 55/60* |
| **8** | 20.0 | .400 | 3.025 Det. | 55/60* |
| | 21.4 | .375 | 3.450 | 40* |
| | 22.8 | .425 | 3.500 | 40* |
| **9** | 25.4 | .450 | 3.500 N.Y. | 55/60* |
| **10** | 21.9 | .325 | 3.450 | 55/60* |
| | 28.5 | .425 | 3.950 Buff. | 55/60* |
| **12** | 32.9 | .500 | 3.500 Clev. | 55/60* |
| | 35.0 | .467 | 3.767 | 55/60* |
| **13** | 31.8 | .375 | 4.000 | 55/60 |
| | 50.0 | .787 | 4.412 | 40 |
| **18** | 42.7 | .450 | 3.950 | 40 |
| | 45.8 | .500 | 4.000 | 40 |
| | 58.0 | .700 | 4.200 | 40 |

* Stock lengths also include 20', 30' and 40'.

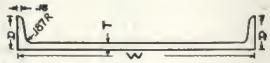
## GALVANIZED CHANNELS

**Hot Rolled—Open Hearth—Hot Dip Process**

All stock size H.R. Channels can be quickly galvanized.

## JUNIOR CHANNELS

### STAIR STRINGER CHANNELS (Rolled Steel)



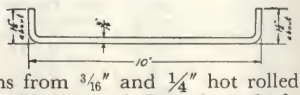
A.S.T.M.—A7-53T for bridges & buildings

Tensile Strength 60,000 to 72,000 psi

Light weight, straight, neat appearing. Rolled especially for stair stringers, although useful for many other purposes requiring a light structural channel.

| Web Width in Inches | Wt. per Ft. in Lbs. | "T" Thickness of Web in Inches | "D" Width of Flange in Inches | Stock Lengths in Feet |
|---|---|---|---|---|
| **10** | 8.4 | .170 | 1.500 | 40 |
| **12** | 10.6 | .190 | 1.500 | 40 |

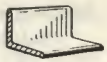
### STAIR STRINGER CHANNELS (Pressed Steel)



Pressed to your specifications from $\frac{3}{16}$" and $\frac{1}{4}$" hot rolled steel. Round corners. Web width optional. Lengths to 24 ft.

*For Junior Beams See page 10*

## ANGLES—Bar Size



**Hot Rolled—Open Hearth**

Sizes to and incl. 2 x 2 x ⅛"—AISI C 1020
Sizes over 2 x 2 x ⅛"—A.S.T.M. A7 MBQ
Tensile Strength 60,000 to 72,000 psi

| Size in Inches | Weight in Pounds per Ft. | 20 Ft. Bar | 40 Ft. Bar | Stock Lengths in Feet |
|---|---|---|---|---|
| ½ x ½ x ⅛ | .38 | 7.60 | 15.20 | 20 |
| ⅝ x ⅝ x ⅛ | .48 | 9.60 | 19.20 | 20 |
| ¾ x ¾ x ⅛ | .59 | 11.80 | 23.60 | 20 |
| ⅞ x ⅞ x ⅛ | .70 | 14.00 | 28.00 | 20 |
| 1 x ⅝ x ⅛ | .64 | 12.80 | 25.60 | 20 |
| 1 x ¾ x ⅛ | .70 | 14.00 | 28.00 | 20 |
| 1 x1 x ⅛ | .80 | 16.00 | 32.00 | 20, 40 |
| 3/16 | 1.16 | 23.20 | 46.40 | 20, 40 |
| ¼ | 1.49 | 29.80 | 59.60 | 20, 40 |
| 1⅛ x 1⅛ x ⅛ | .90 | 18.00 | 36.00 | 20 |
| 1¼ x 1¼ x ⅛ | 1.01 | 20.20 | 40.40 | 20, 40 |
| 3/16 | 1.48 | 29.60 | 59.20 | 20, 40 |
| ¼ | 1.92 | 38.40 | 76.80 | 20, 40 |
| 1⅜ x ⅞ x ⅛ | .91 | 18.20 | 36.40 | 20, 40 |
| 3/16 | 1.32 | 26.40 | 52.80 | 20 |
| 1½ x 1¼ x 3/16 | 1.64 | 32.80 | 65.60 | 20 |
| 1½ x 1½ x ⅛ | 1.23 | 24.60 | 49.20 | 20, 40 |
| 3/16 | 1.80 | 36.00 | 72.00 | 20, 40 |
| ¼ | 2.34 | 46.80 | 93.60 | 20, 40 |
| 1¾ x 1¼ x ⅛ | 1.23 | 24.60 | 49.20 | 20 |
| 1¾ x 1¾ x ⅛ | 1.44 | 28.80 | 57.60 | 20, 40 |
| 3/16 | 2.12 | 42.40 | 84.80 | 20, 40 |
| ¼ | 2.77 | 55.40 | 110.80 | 20, 40 |
| 2 x1 ¼ x 3/16 | 1.96 | 39.20 | 78.40 | 20, 40 |
| ¼ | 2.55 | 51.00 | 102.00 | 20, 40 |
| 2 x1 ½ x ⅛ | 1.44 | 28.80 | 57.60 | 20, 40 |
| 3/16 | 2.12 | 42.40 | 84.80 | 20, 40 |
| ¼ | 2.77 | 55.40 | 110.80 | 20, 40 |
| 2 x2 x ⅛ | 1.65 | 33.00 | 66.00 | 20, 40 |
| 3/16 | 2.44 | 48.80 | 97.60 | 20, 40 |
| ¼ | 3.19 | 63.80 | 127.60 | 20, 40 |
| 5/16 | 3.29 | 78.40 | 156.80 | 40 |
| ⅜ | 4.70 | 94.00 | 188.00 | 40 |
| 2¼ x 1½ x 3/16 | 2.28 | 45.60 | 91.20 | N.Y. 20 |
| 2½ x 1½ x 3/16 | 2.44 | 48.80 | 97.60 | 20, 40 |
| ¼ | 3.19 | 63.80 | 127.60 | 20, 40 |
| 5/16 | 3.92 | 78.40 | 156.80 | Det. 20 |
| 2½ x2 x 3/16 | 2.75 | 55.00 | 110.00 | 20, 40 |
| ¼ | 3.62 | 72.40 | 144.80 | 20, 40 |
| 5/16 | 4.50 | 90.00 | 180.00 | 20, 40 |
| ⅜ | 5.30 | 106.00 | 212.00 | 20, 40 |
| 2½ x2 ½ x 3/16 | 3.07 | 61.40 | 122.80 | 20, 40 |
| ¼ | 4.10 | 82.00 | 164.00 | 20, 40 |
| 5/16 | 5.00 | 100.00 | 200.00 | 20, 40 |
| ⅜ | 5.90 | 118.00 | 236.00 | 20, 40 |
| ½ | 7.70 | 154.00 | 308.00 | 20, 40 |
| 3 x2 x 3/16<br>3 x3 x 3/16 | *For these and all larger sizes, see page 14.* | | | |

**Pickled and Oiled Angles**—All angles on pages 13 and 14 can be supplied pickled and oiled. We will gladly quote.

**Galvanized Angles**—All angles on pages 13 and 14 can be quickly galvanized. We will be happy to quote. Our galvanized coat is made to A.S.T.M. spec. A123-47 and is subject to the 4-Dip Preece Test A.S.T.M. A239-41.

## ANGLES — Structural

A.S.T.M.—A7-53T • T. S. 60,000 to 72,000 psi

| Size in Inches | | | | Wt. per Ft. in Lbs. | Stock Lgths., Ft. |
|---|---|---|---|---|---|
| 3 | x2 | x | 3/16 | 3.07 | 40* |
| | | | 1/4 | 4.1 | 40* |
| | | | 5/16 | 5.0 | 40* |
| | | | 3/8 | 5.9 | 40* |
| | | | 1/2 | 7.7 | 40* |
| 3 | x2 1/2 | x | 1/4 | 4.5 | 40* |
| | | | 5/16 | 5.6 | 40* |
| | | | 3/8 | 6.6 | 40* |
| | | | 1/2 | 8.5 | 40* |
| 3 | x3 | x | 3/16 | 3.71 | 40* |
| | | | 1/4 | 4.9 | 40* |
| | | | 5/16 | 6.1 | 40* |
| | | | 3/8 | 7.2 | 40* |
| | | | 7/16 | 8.3 | 40* |
| | | | 1/2 | 9.4 | 40* |
| 3 1/2 | x2 1/2 | x | 1/4 | 4.9 | 40* |
| | | | 5/16 | 6.1 | 40* |
| | | | 3/8 | 7.2 | 40* |
| | | | 1/2 | 9.4 | 40* |
| 3 1/2 | x3 | x | 1/4 | 5.4 | 40* |
| | | | 5/16 | 6.6 | 40* |
| | | | 3/8 | 7.9 | 40* |
| | | | 1/2 | 10.2 | 40* |
| 3 1/2 | x3 1/2 | x | 1/4 | 5.8 | 40* |
| | | | 5/16 | 7.2 | 40* |
| | | | 3/8 | 8.5 | 40* |
| | | | 7/16 | 9.8 | 40* |
| | | | 1/2 | 11.1 | 40* |
| 4 | x3 | x | 1/4 | 5.8 | 40* |
| | | | 5/16 | 7.2 | 40* |
| | | | 3/8 | 8.5 | 40* |
| | | | 7/16 | 9.8 | 40* |
| | | | 1/2 | 11.1 | 40* |
| | | | 5/8 | 13.6 | 40* |
| 4 | x3 1/2 | x | 1/4 | 6.2 | 40* |
| | | | 5/16 | 7.7 | 40* |
| | | | 3/8 | 9.1 | 40* |
| | | | 7/16 | 10.6 | 40* |
| | | | 1/2 | 11.9 | 40* |
| 4 | x4 | x | 1/4 | 6.6 | 40* |
| | | | 5/16 | 8.2 | 40* |
| | | | 3/8 | 9.8 | 40* |
| | | | 7/16 | 11.3 | 40* |
| | | | 1/2 | 12.8 | 40* |
| | | | 5/8 | 15.7 | 40* |
| 4 | x4 | x | 3/4 | 18.5 | 40* |
| 5 | x3 | x | 1/4 | 6.6 | 40* |
| | | | 5/16 | 8.2 | 55/60* |
| | | | 3/8 | 9.8 | 55/60* |
| | | | 7/16 | 11.3 | 55/60* |
| | | | 1/2 | 12.8 | 55/60* |
| 5 | x3 1/2 | x | 5/16 | 8.7 | 55/60* |
| | | | 3/8 | 10.4 | 55/60* |
| | | | 7/16 | 12.0 | 55/60* |
| | | | 1/2 | 13.6 | 55/60* |
| | | | 5/8 | 16.8 | 55/60* |
| | | | 3/4 | 19.8 | 55/60* |
| 5 | x5 | x | 3/8 | 12.3 | 55/60* |
| | | | 1/2 | 16.2 | 55/60* |
| | | | 5/8 | 20.0 | 55/60* |
| | | | 3/4 | 23.6 | 55/60* |
| 6 | x3 1/2 | x | 5/16 | 9.8 | 40* |
| | | | 3/8 | 11.7 | 55/60* |
| | | | 1/2 | 15.3 | 55/60* |
| 6 | x4 | x | 5/16 | 10.3 | 40* |
| | | | 3/8 | 12.3 | 55/60* |
| | | | 7/16 | 14.3 | 55/60* |
| | | | 1/2 | 16.2 | 55/60* |
| | | | 5/8 | 20.0 | 55/60* |
| | | | 3/4 | 23.6 | 55/60* |
| | | | 7/8 | 27.2 | 55/60* |
| 6 | x6 | x | 3/8 | 14.9 | 55/60* |
| | | | 1/2 | 19.6 | 55/60* |
| | | | 5/8 | 24.2 | 55/60* |
| | | | 3/4 | 28.7 | 55/60 |
| | | | 7/8 | 33.1 | 55/60 |
| | | | 1 | 37.4 | 55/60 |
| 7 | x4 | x | 3/8 | 13.6 | 55/60 |
| | | | 1/2 | 17.9 | 55/60 |
| | | | 5/8 | 22.1 | 55/60 |
| | | | 3/4 | 26.2 | Det. |
| 8 | x4 | x | 1/2 | 19.6 | 40 |
| 8 | x6 | x | 1/2 | 23.0 | 40 |
| | | | 3/4 | 33.8 | 40 |
| | | | 1 | 44.2 | 40 |
| 8 | x8 | x | 1/2 | 26.4 | 40 |
| | | | 5/8 | 32.7 | 40 |
| | | | 3/4 | 38.9 | 40 |
| | | | 7/8 | 45.0 | 40 |
| | | | 1 | 51.0 | 40 |

* Stock lengths also include 20', 30' and 40'.

## GALVANIZED ANGLES—Bar Size—C 1020

### Hot Rolled—Open Hearth—Hot Dip Process

Galv. coat meets ASTM A123-47 and 4-Dip Preece Test ASTM A-239-41.

| Size in Inches | | | | Approx. Wt., Lbs. Per Ft. | Approx. Wt., Lbs. 20' Bar | Stock Lgths. in Ft. |
|---|---|---|---|---|---|---|
| 5/8 | x 5/8 | x 1/8 | | .50 | 10.00 | Buff. |
| 3/4 | x 3/4 | x 1/8 | | .62 | 12.40 | St.L. |
| 1 | x1 | x 1/8 | | .84 | 16.80 | 20 |
| 1 1/4 | x1 1/4 | x 1/8 | | 1.06 | 21.20 | 20 |
| | | | 3/16 | 1.55 | 31.00 | 20 |
| 1 1/2 | x1 1/2 | x 1/8 | | 1.29 | 25.80 | 20 |
| | | | 3/16 | 1.89 | 37.80 | 20 |
| 1 1/2 | x1 1/2 | x 1/4 | | 2.46 | 49.20 | 20 |
| 1 3/4 | x1 3/4 | x 1/8 | | 1.51 | 30.20 | 20 |
| 2 | x2 | x 1/8 | | 1.73 | 34.60 | 20 |
| | | | 3/16* | 2.56 | 51.20 | 20 |
| | | | 1/4* | 3.35 | 67.00 | 20 |
| 2 1/2 | x2 1/2 | x 1/4* | | 4.31 | 86.20 | 20 |

* ASTM A7

## TEES — Bar Size

**Hot Rolled—Open Hearth**

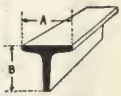
Sizes under 2 x 2 x ¼"—AISI C 1020

Sizes 2 x 2 x ¼" and larger—A.S.T.M. A7 MBQ

Tensile Strength 60,000 to 72,000 psi

| "A" Flange, Inches | "B" Stem, Inches | Stem Thick. Inches | Weight in Pounds Per Ft. | 20 Ft. Bar | 40 Ft. Bar | Stock Lengths in Ft. |
|---|---|---|---|---|---|---|
| ¾ | ¾ | ⅛ | .62 | 12.40 | 24.80 | 20 |
| ⅞ | ⅞ | ⅛ | .73 | 14.60 | 29.20 | 20 |
| 1 | 1 | ⅛ | .85 | 17.00 | 34.00 | 20 |
| | | 3/16 | 1.20 | 24.00 | 48.00 | 20 |
| 1¼ | 1¼ | ⅛ | 1.09 | 21.80 | 43.60 | 20 |
| | | 3/16 | 1.55 | 31.00 | 62.00 | 20 |
| | | ¼ | 1.93 | 38.60 | 77.20 | 20 |
| 1½ | 1½ | 3/16 | 1.90 | 38.00 | 76.00 | 20 |
| | | ¼ | 2.43 | 48.60 | 97.20 | 20, 40 |
| 1¾ | 1¾ | 3/16 | 2.26 | 45.20 | 90.40 | 20 |
| | | ¼ | 2.90 | 58.00 | 116.00 | 20 |
| 2 | 1½ | ¼ | 3.10 | 62.00 | 124.00 | 20 |
| 2 | 2 | ¼ | 3.62 | 72.40 | 144.80 | 20, 40 |
| | | 5/16 | 4.30 | 86.00 | 172.00 | 20, 40 |
| 2¼ | 2¼ | ¼ | 4.10 | 82.00 | 164.00 | 20, 40 |
| 2½ | 2½ | ¼ | 4.60 | 92.00 | 184.00 | 20, 40 |
| | | 5/16 | 5.50 | 110.00 | 220.00 | 20, 40 |
| | | ⅜ | 6.40 | 128.00 | 256.00 | 20, 40 |

## TEES — Structural

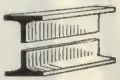



A.S.T.M.—A7-53T for bridges and buildings

Tensile Strength 60,000 to 72,000 psi

*Specify tees by flange first, then stem and thickness*

| "A" Flange in Inches | "B" Stem in Inches | Stem Thickness in Inches | Weight per Ft. in Lbs. | Stock Lengths in Feet |
|---|---|---|---|---|
| 3 | 2½ | 5/16 | 6.1 | 20, 30, 40 |
| 3 | 3 | 5/16 | 6.7 | 20, 30, 40 |
| | | ⅜ | 7.8 | 20, 30, 40 |
| 4 | 2½ | ⅜ | 8.5 | Detroit |
| 4 | 3 | ⅜ | 9.2 | 20, 30, 40 |
| 4 | 4 | ½ | 13.5 | 20, 30, 40 |
| 5 | 3⅛ | ½ | 13.6 | 20, 30, 40 |

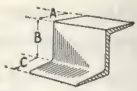


**Special Tees**—You may select additional sizes of Tees by having us flame-cut a structural I-Beam, Wide Flange Beam, etc. into two, T-shaped halves. Be sure to order in pairs.

**Galvanized Tees**—All stock size or special Tees can be quickly galvanized to order. We will be glad to quote.

## ZEES — Bar Size

**Copper Bearing Quality AISI C 1020**

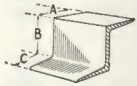



Hot Rolled—Open Hearth—Minimum Copper Content .20

| "A" Flange in Inches | "B" Depth in Inches | "C" Flange in Inches | Thickness in Inches | Weight per Ft. in Lbs. | Stock Lengths in Ft. |
|---|---|---|---|---|---|
| 1¼ | 1¾ | 1¾ | 3/16 | 2.79 | 20 |
| 1¾ | 1¾ | 1¾ | 3/16 | 3.16 | 20 |

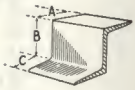
## ZEES — Structural

A.S.T.M.—A7-53T for bridges and buildings
Tensile Strength 60,000 to 72,000 psi




| "A" Flange in Inches | "B" Depth in Inches | "C" Flange in Inches | Thickness in Inches | Weight per Ft. in Lbs. | Stock Lengths in Ft. |
|---|---|---|---|---|---|
| 2 1/16 | 3 | 2 1/16 | ¼ | 6.7 | 20, 30, 40 |
| 2 1/16 | 3 | 2 1/16 | 3/8 | 9.8 | 20, 30, 40 |
| 2 1/16 | 3 | 2 1/16 | ½ | 12.6 | 20, 30, 40 |
| 3 1/16 | 4 | 3 1/16 | ¼ | 8.2 | 20, 30, 40 |
| 3 1/8 | 4 1/16 | 3 1/8 | 5/16 | 10.3 | 20, 30, 40 |
| 3 1/8 | 4 1/16 | 3 1/8 | ½ | 15.9 | 20, 30, 40 |
| 3 3/16 | 4 1/8 | 3 3/16 | 3/8 | 12.5 | 20, 30, 40 |
| 3¼ | 5 | 3¼ | 5/16 | 11.6 | 20, 30, 40 |
| 3¼ | 5 | 3¼ | ½ | 17.9 | 20, 30, 40 |
| 3 5/16 | 5 1/16 | 3 5/16 | 3/8 | 14.0 | 20, 30, 40 |
| 3½ | 6 | 3½ | 3/8 | 15.7 | 20, 30, 40 |
| 3 5/8 | 6 1/8 | 3 5/8 | ½ | 21.1 | 20, 30, 40 |

**Galvanized Zees**—All stock size or special Zees can be quickly galvanized to order. We will be glad to quote.



## ROLLED RINGS

Open butt or welded joint rings, rolled leg in or out, are furnished promptly from our large and complete stock of angles. We also supply rings rolled from bars, tees, channels, standard beams and rails. Send us your specifications and we will be glad to quote and give complete information.

# *Construction Products*


**CONCRETE REINFORCING PRODUCTS**

Re-bars . . . . . 19
Reinforcing Accessories . . . . . 19
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**THREADED PRODUCTS**

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**RYEX EXPANDED METAL**

. . . . . *Refer to Sheet Section*

## COMPLETE REINFORCING SERVICE

*Nationwide fabrication service from these Ryerson plants:*

New York • Boston • Buffalo • Cleveland
Cincinnati • Detroit • Chicago • Milwaukee
Los Angeles • San Francisco • Seattle • Spokane

Besides maintaining large stocks of reinforcing bars, Ryerson handles the complete re-bar fabrication job from estimate to final delivery—including preparation of detailed setting plans. Bars are cut or bent, as specified and are tagged and carefully bundled for quick placement on the job. Deliveries are conveniently scheduled with the job's progress. Here's a quick review of the service available to you:

### Setting Plans Drawn

Each piece of steel is correctly located and its position numbered.

### Accurate Fabrication

Our modern equipment handles the bending and cutting of reinforcing bars in any tonnage to your specifications.

### Tagged for Quick Placement

Sturdy metal tags stamped with the number assigned by the setting plans are wired to each item of steel. Tags will not wear or tear off.

## MAY WE QUOTE?

Prompt estimates on the cost of every job are given in either lump sum or average pound price, whichever is desired. We will gladly quote, or, if more information is needed, we suggest you call us or write for bulletin on this Ryerson reinforcing service.

## HI-BOND CONCRETE REINFORCING BARS

**Offer approximately twice the bonding value of the ordinary commercial deformed reinforcing bar**

Hi-Bond reinforcing bars are scientifically designed with double reverse helical ribs between horizontal ribs, providing the strongest known mechanical bond between steel and concrete. Pull tests on imbedded bars reveal that the yield point of the bar must be exceeded before any measurable slippage occurs. Thus "wide cracks" are eliminated and most end hooks are entirely unnecessary. And performance is in keeping with the latest developments in high strength concrete, thereby offering many opportunities for new improved design, and lighter, stronger construction with actual material savings.

Hi-Bond bars of intermediate grade conform to all building codes and to the ASTM specifications A-15-52T and A-305-50T. Tensile Strength 70,000 to 90,000 psi.; and 40,000 psi. min. Yield Point. Structural and Hard Grades of new billet are furnished on request.

### NEW BILLET DEFORMED ROUNDS

| Bar No. | Bar Size in Inches | Nominal Dimensions in Inches: Diameter in Inches | Area Sq. In. | Perimeter in Inches | Weight per Ft. in Lbs. |
|---|---|---|---|---|---|
| 2 | ¼ rd. | 0.250 | 0.05 | 0.786 | 0.167 |
| 3 | ⅜ rd. | 0.375 | 0.11 | 1.178 | 0.376 |
| 4 | ½ rd. | 0.500 | 0.20 | 1.571 | 0.668 |
| 5 | ⅝ rd. | 0.625 | 0.31 | 1.963 | 1.043 |
| 6 | ¾ rd. | 0.750 | 0.44 | 2.356 | 1.502 |
| 7 | ⅞ rd. | 0.875 | 0.60 | 2.749 | 2.044 |
| 8 | 1 rd. | 1.000 | 0.79 | 3.142 | 2.670 |
| 9 | **1 sq. | 1.128 | 1.00 | 3.544 | 3.400 |
| 10 | **1⅛ sq. | 1.270 | 1.27 | 3.990 | 4.303 |
| 11 | **1¼ sq. | 1.410 | 1.56 | 4.430 | 5.313 |

Quarter inch bars are plain round, not deformed.
** All bars are rounds. These sizes are equivalent in cross section area to the standard square reinforcing bar sizes indicated. Rail steel bars can also be furnished.

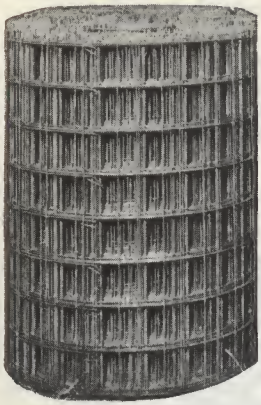
### REINFORCING ACCESSORIES

Bar Spacers, Bar Chairs, Screed Chairs, Bar Ties, Inserts and other accessories are furnished and delivered as required by the progress of the job.

Metal Road Strip, Pins, Bar Supports and Expansion Joints, used by many states in the construction of concrete roads are furnished to meet any specification.

**HI-BOND GAGGER BARS** *(See page 28)*

## WIRE FABRIC — Electric Welded



- Made from cold drawn steel wires electrically welded at every intersection to assure maximum strength and rigidity.
- Furnished in rolls in various gauges and spacings. The most common styles appear in the table below.
- Other spacings and gauges furnished for special requirements.

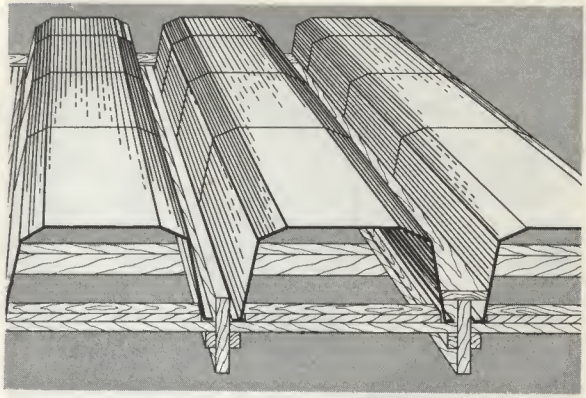
| Spacing of Wires In Inches | | Gauge of Wires | | Section Areas Per Foot of Width | | Weight Per 100 Sq. Ft. in Lbs. | Size of Rolls in Feet* |
|---|---|---|---|---|---|---|---|
| Long. | Trans. | Long. | Trans. | Long. Sq. In. | Trans. Sq. In. | | |
| **Two Way Reinforcement** | | | | | | | |
| 6 x 6 | | 10 | 10 | .029 | .029 | 21 | 5x150 |
| 6 x 6 | | 8 | 8 | .041 | .041 | 30 | 5x150 |
| 6 x 6 | | 6 | 6 | .058 | .058 | 42 | 5x150 |
| 6 x 6 | | 4 | 4 | .080 | .080 | 58 | 5x150 |
| 4 x 4 | | 13 | 13 | .020 | .020 | 14 | 4x200 |
| 4 x 4 | | 10 | 10 | .043 | .043 | 31 | 5x150 |
| 4 x 4 | | 4 | 4 | .120 | .120 | 85 | 5x150 |
| **Beam Wrapper and Gunite Reinforcement** | | | | | | | |
| 2 x 2 | | 14 | 14 | .030 | .030 | 21 | 5x150 |
| 2 x 2 | | 12 | 12 | .052 | .052 | 37 | 5x150 |

* Special roll widths and flat sheets can be furnished on a mill delivery basis.

**Galvanized Mesh** can be furnished as well as plain. When plain fabric is ordered, longitudinal wires are plain but cross wires are plain or galvanized at the manufacturer's discretion. All wires on Beam Wrapper and Gunite reinforcements are galvanized.

**Tensile Strength** of Electric Welded Fabric is 60,000 to 70,000 psi. When ordered to meet A.S.T.M. specs., it will be furnished having a tensile strength of 70,000 psi or more.

**For more complete information** on our reinforcing service, please write or call us for our complete illustrative bulletin



Removable Steel Forms for Concrete Joist Construction

## FORMS — For Concrete Joist Construction

We furnish Removable Steel Forms of either the slip in or nail down type. Standard removable steel forms, 20 or 30 inches wide give joist depth of 6, 8, 10, 12 and 14 inches. Special filler forms for odd spaces furnished in widths of 10, 15, 20 and 30 inches.

## SPIRALS — For Concrete Column Reinforcing

Made from Hot Rolled Wire Rod, in ¼″, ⅜″, ½″ and ⅝″ diameter, complete with steel channel spacers. Collapsible for shipment. Used for reinforcing concrete columns.

## CAISSON RINGS

Used for support of wood lagging in deep foundation construction, these rings are made in two halfs bolted together with one or two standard machine bolts at each connection.

They can be furnished made from flat bars with ends bent to form lugs for bolting the halves together, or made from standard structural steel channels with plates welded on at right angles to ends to form connections. Since Caisson Rings are sold by weight, Channel Rings are generally more economical than Flat Bar Rings of the same stiffness, and are much easier to handle because of their lighter weight.

## CREX PATENT COLUMNS
## LALLY BROS. COLUMNS

**Rolled Steel Cylinder—Concrete Filled**

Supporting Columns for Construction Work

Lightweight Columns—3, 3½ and 4″ Diam.
Heavyweight Columns—3½″ to 12¾″ Diam.

Steel caps, bases and brackets can be fabricated to your specifications for all structural requirements.

## OPEN WEB STEEL JOISTS

Architects, builders and engineers are finding increased uses for open web steel joists. Low in cost, their resistance to fire and ease of erection recommend them for floors and ceilings in industrial buildings, apartments, dormitories and residences.

Ready for immediate placement on the job, these rigid, light weight joists require no temporary forming work. Their amazingly low dead load reduces the requirements for supporting beams, columns and footings—and their light weight means that no special equipment is needed for handling. Pipes, conduits and small ducts readily pass through the open webs, while fire resistant ceilings can be fastened directly to the bottom chord without furring channels.

Each Ryerson joist is coated with a protective layer of asphalt paint. Special coatings can be specified as required.

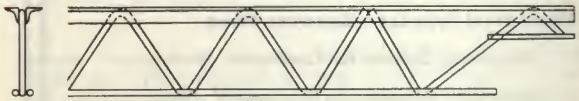
All Ryerson open web steel joists are designed in accordance with the United States Department of Commerce Simplified Practice Recommendation R 94-30.

**SIZES**—8, 10, 12, 14, 16, 18 and 20 inches in depth—in lengths up to 40 feet.

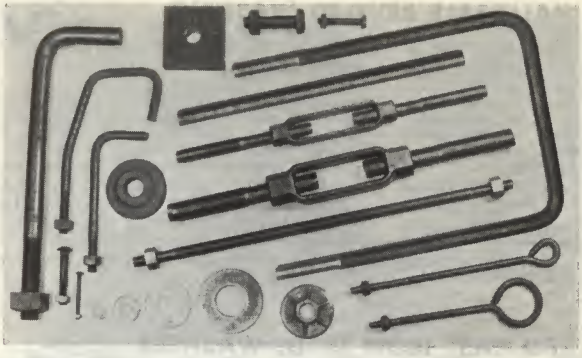
**LONG SPAN JOISTS**—For greater loads with less deflection, long span joists 18″ to 48″ in depth are fabricated to order.

**ACCESSORIES**—Bridging, anchors, ceiling extensions and other accessories are furnished to your specifications.

**ORDER INFORMATION**—The following information should be included on all inquiries or orders: 1. Type of joist. 2. Overall length. 3. Clear span. 4. Type of bearing support. 5. Accessories needed.



These all-welded joists are designed for maximum strength and rigidity with least weight. Each pound of steel is a working part of the joist. Two hot rolled angles form the top chord, two round bars the bottom chord, with another round bar for the web.



## THREADED BARS AND PRODUCTS

**For Mechanical Applications—Construction Purposes**

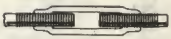
In Carbon, Alloy or Stainless Steel

We have complete facilities for threading steel bars with American National Form Thread. You can order carbon, alloy or stainless bars threaded right or left hand to any desired length—with either National Coarse (previously known as United States Standard) or National Fine (S.A.E.) threads.

In addition, we are able to furnish tank rods, turnbuckle tie rods, truss rods, anchor bolts, U-bolts, J-bolts, eye bolts, continuous threaded bars, etc. Send us your inquiries and orders. We have the steel. . . large stocks of carbon, alloy and stainless bars. And, we have the facilities for quickly and accurately threading and forming bars to your exact specifications.

Related products are also furnished, including tank lugs, chimney bands, ladder rungs and steps, steel plate washers, beveled malleable washers, cast iron and wrought steel washers, nuts and turnbuckles.

### TURNBUCKLES



| Diameter & Takeup in Inches | Overall Length in Inches | | Approximate Wt. in Lbs. | |
|---|---|---|---|---|
| | Without Stubs | With Stubs Extended | Without Stubs | With Stubs |
| ⅜x6 | 7⅛ | 19 | .42 | .78 |
| ½x6 | 7½ | 22 | .70 | 1.52 |
| ⅝x6 | 7⅞ | 22 | .89 | 2.17 |
| ¾x6 | 8¼ | 23 | 1.20 | 3.19 |
| ⅞x6 | 8⅝ | 24 | 1.46 | 4.20 |
| 1 x6 | 9 | 25 | 2.27 | 6.19 |
| 1⅛x6 | 9⅜ | 25 | 2.72 | 7.70 |
| 1¼x6 | 9¾ | 26 | 3.58 | 9.98 |
| 1⅜x6 | 10½ | 27 | 4.13 | 12.23 |
| 1½x6 | 10½ | 27 | 5.25 | 14.95 |
| 1⅝x6 | 10⅞ | 28 | 5.88 | 17.88 |
| 1¾x6 | 11¼ | 28 | 7.05 | 20.89 |
| 2 x6 | 12 | 29 | 9.95 | 28.95 |
| 2¼x6 | 13½ | 30 | 18.00 | 43.50 |

## MALLEABLE BEVELED WASHERS

Washers slope 2″ in 12″. Used on flanges of standard I beams, channels, and other structural sections.

| Bolt Size Inches | Outside Dimensions Inches | Approx. Wt. in Lbs. per 100 | Bolt Size Inches | Outside Dimensions Inches | Approx. Wt. in Lbs. per 100 |
|---|---|---|---|---|---|
| 3/8 | 1 1/4 x 1 1/4 | 9.2 | 3/4 | 1 1/2 x 1 1/2 | 16.0 |
| 1/2 | 1 1/4 x 1 1/4 | 9.0 | 7/8 | 2 x2 | 33.0 |
| 5/8 | 1 1/2 x 1 1/2 | 14.5 | 1 | 2 x2 | 31.0 |

We can also furnish these washers for use with Wide Flange Beams, in sizes 3/4″, 7/8″ and 1″.

## ST'D CAST IRON O. G. WASHERS

Made of High Grade Iron

| Bolt Size in Inches | Inside Diameter in Inches | Outside Diameter in Inches | Thickness in Inches | Approx. Wt in Lbs. per 100 Pcs. |
|---|---|---|---|---|
| 1/2 | 5/8 | 2 3/8 | 5/8 | 45 |
| 5/8 | 3/4 | 2 3/4 | 3/4 | 60 |
| 3/4 | 7/8 | 3 | 13/16 | 85 |
| 7/8 | 1 | 3 1/2 | 15/16 | 140 |
| 1 | 1 1/8 | 4 1/8 | 1 1/16 | 175 |
| 1 1/8 | 1 1/4 | 4 1/2 | 1 5/16 | 300 |
| 1 1/4 | 1 3/8 | 5 | 1 7/16 | 400 |
| 1 1/2 | 1 3/4 | 6 | 1 9/16 | 600 |

## STANDARD WROUGHT WASHERS

200 lb. kegs.

| Bolt Size in Inches | Outside Diameter in Inches | Size of Hole | Thickness in Wire Gauge | Estimated No. in 100 lbs. | Approx. Wt. per 1000 Pcs. |
|---|---|---|---|---|---|
| 3/16 | 9/16 | 1/4 | 18(3/64) | 36200 | 2.76 |
| 1/4 | 3/4 | 5/16 | 16(1/16) | 14900 | 6.71 |
| 5/16 | 7/8 | 3/8 | 14(5/64) | 9000 | 11.11 |
| 3/8 | 1 | 7/16 | 14(5/64) | 6700 | 14.93 |
| 7/16 | 1 1/4 | 1/2 | 14(5/64) | 4100 | 24.39 |
| 1/2 | 1 3/8 | 9/16 | 12(7/64) | 2600 | 38.46 |
| 9/16 | 1 1/2 | 5/8 | 12(7/64) | 2200 | 45.45 |
| 5/8 | 1 3/4 | 11/16 | 10(9/64) | 1300 | 76.92 |
| 3/4 | 2 | 13/16 | 9(5/32) | 910 | 109.88 |
| 7/8 | 2 1/4 | 15/16 | 8(11/64) | 652 | 153.37 |
| 1 | 2 1/2 | 1 1/16 | 8(11/64) | 532 | 187.97 |
| 1 1/8 | 2 3/4 | 1 1/4 | 8(11/64) | 454 | 220.26 |
| 1 1/4 | 3 | 1 3/8 | 8(11/64) | 384 | 260.41 |
| 1 3/8 | 3 1/4 | 1 1/2 | 7(3/16) | 300 | 333.33 |
| 1 1/2 | 3 1/2 | 1 5/8 | 7(3/16) | 260 | 384.61 |
| 1 5/8 | 3 3/4 | 1 3/4 | 7(3/16) | 227 | 440.52 |
| 1 3/4 | 4 | 1 7/8 | 7(3/16) | 200 | 500.00 |
| 1 7/8 | 4 1/4 | 2 | 7(3/16) | 176 | 568.18 |
| 2 | 4 1/2 | 2 1/8 | 7(3/16) | 159 | 628.93 |

## SPECIAL WASHERS

Flat Washers other than standard sizes are blanked to your specifications. We also furnish blanks punched to approximately any size or shape.

## GRATINGS — RYEX EXPANDED METAL

*For Ryex Expanded Metal sheets, see pages 54 and 55*

Expanded metal grating continues to find increased acceptance wherever a strong, low-cost, easily installed, open flooring is needed. Stocked in several different styles and weights, in plain or galvanized finish, Ryex is used for plant runways, catwalks, stair treads, machine platforms, and many other lightweight flooring applications.

**Fabricating Facts:**

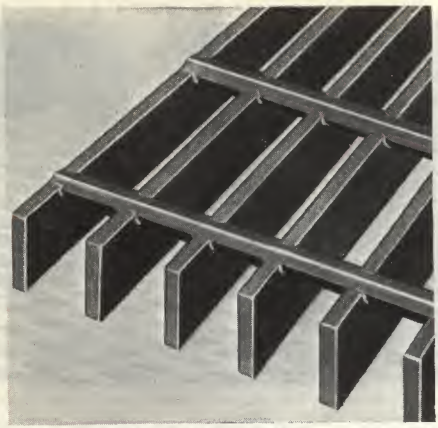
1. Ryex grating should always be bolted or welded to supports.
2. For maximum strength, rigidity and traction, run long way of diamond *perpendicular* to supports and direction of traffic. (Run supports in same direction as traffic movement.)
3. On each sheet of Ryex grating the long way of diamond runs *parallel* to the length of the sheet.

*In Stock for Immediate Shipment*

| Grating | Weight per Sq. Ft. | Approx. Strand Size, Inches Th. & Width | Size of Opening in Inches Width & Lgth. | Cent to Cent. of Bridges in Inches Width & Lgth. | Standard Sizes in Inches |
|---|---|---|---|---|---|
| Walkway | 4.29 | .243x.300 | 1 x2 7/8 | 1.412 4.00 | 4x8, 6x 8 |
| Skywalk | 3.14 | .243x.312 | 1 5/8x4 7/8 | 2.000 6.00 | 4x10 |
| 4.0 Lb. | 4.00 | .215x.300 | 1 5/16x3 7/16 | 1.333 5.33 | 4, 5 or 6x8 |
| 6.25 Lb. | 6.25 | .312x.350 | 1 3/16x3 3/8 | 1.412 5.33 | 4x 8 |
| *Shipped from Mill* | | | | | |
| Skywalk | 3.14 | .243x.312 | 1 5/8x4 7/8 | 2.000 6.00 | 6x10 |
| 3.0 Lb. | 3.00 | .183x.264 | 1 5/16x3 7/16 | 1.333 5.33 | 3x8, 6x 8 |
| 5.0 Lb. | 5.00 | .250x.331 | 1 3/16x3 3/8 | 1.333 5.33 | 4x8, 5x 8 |
| 6.25 Lb. | 6.25 | .312x.350 | 1 3/16x3 3/8 | 1.412 5.33 | 6x 8 |

**STANDARD LOAD TABLE (Customary Practice)**

| CONCENTRATED LOAD Lbs. per Foot of Width (SWD) | | SPAN IN INCHES (LWD) 24" | 30" | 36" |
|---|---|---|---|---|
| **50 LB.** | For limited pedestrian use—window washers, maintenance men, etc. | Skywalk or 3 Lb. | Skywalk or 3 Lb. | Walkway or 4 Lb. |
| **100 LB.** | For normal pedestrian traffic | Skywalk or 3 Lb. | Walkway or 4 Lb. | 5.0 lb. or 6.25 lb. |
| **150 LB.** | For heavy pedestrian traffic—workman with light equipment, etc. | Walkway or 4 lb. | 5.0 lb. or 6.25 lb. | 6.25 lb. |



## OPEN STEEL GRATING & TREADS

### RYWELD

Ry-Weld Open Steel Flooring is of the resistance welded rectangular type. "V" shaped cross bars, under heat and pressure, are forced into and welded to the bearing bars. This results in a strong, rigid and durable, one piece steel flooring material.

Easily installed and maintained, open steel flooring is recommended for all grating applications including walkways, floors, stairs, fire escapes, decks, around machinery and similar uses. Ryerson engineers will gladly work with you in adapting this material to your requirements. So call us for every open steel flooring need; and send for descriptive literature. We have complete facilities for fabricating to your drawings and specifications.

### SIZES IN STOCK

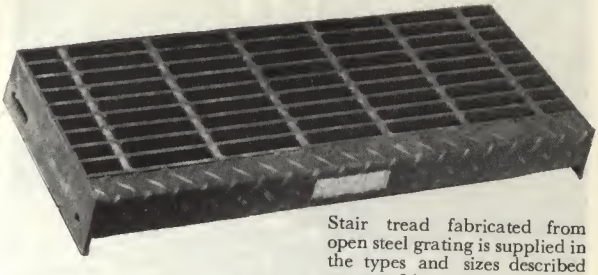
| Size of Bearing Bars 1" Apart | Width & Length | Size of Bearing Bars 1" Apart | Width & Length |
|---|---|---|---|
| 1"x3/16" | 24"x120" | 1 1/4"x3/16" | 24"x120" |
| | 24"x240" | | 24"x240" |
| | 36"x120" | | 36"x120" |
| | 36"x240" | | 36"x240" |

### TYPES AVAILABLE ON SPECIAL ORDER

Besides the stock size panels of electric welded grating shown above, many other types are available on special order. Cross bars may be spaced at closer intervals than the standard 4" spacing—at 3", 2" and 1½" intervals. Bearing bars may be specified serrated for all standard types of grating—or in different thicknesses, greater depths and closer spacings for more severe load applications. Grating can be tailor made to fit your job—completely fabricated with all necessary cut-outs and banding—ready for erection.

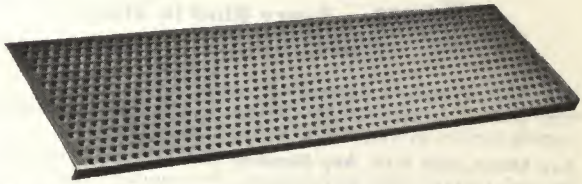
So contact your Ryerson steel service plant for your open steel grating needs. Our engineers will work directly with you, or from your sketch or blueprint, to determine the type of grating best suited for your requirements.

## OPEN STEEL STAIR TREAD



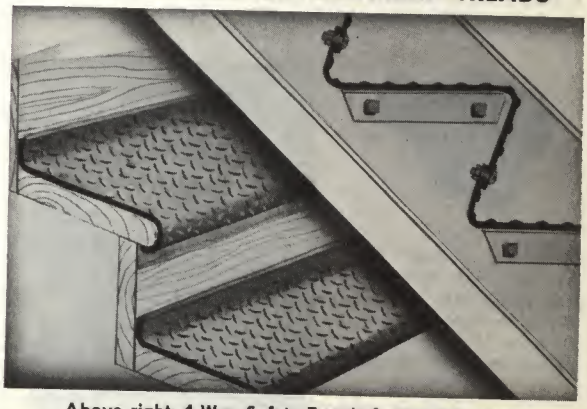
Stair tread fabricated from open steel grating is supplied in the types and sizes described on page 26.

## MORTON KASS SAFETY TREAD



These treads are made in 10, 12, 14 or 16 Ga. in any shape or size up to 36″ x 120″. Available with perforated or unperforated buttons, which may be omitted in any area for margins, smooth flanges or to fit your specifications. Furnished with or without a nosing or short riser. Send for descriptive bulletin.

## INLAND 4-WAY SAFETY PLATE TREADS



**Above right: 4-Way Safety Treads fastened to steel.**
**Above left: 4-Way Safety Treads fastened to wood.**

Treads and landings, made from Inland 4-Way Safety Plates give additional safety, rigidity and long life. They are furnished either with or without a nosing or short riser. All treads are made to specifications for use in either straight or winding stairways.

## PLATES — Every Kind In Stock

*Flame Cut to Shape*

**The Most Complete Service**—Ryerson has every kind of steel plate in stock and the fastest, most complete flame-cutting service available—including Electric Eye.

**Any Shape, Any Size, Any Number** from any plate including high carbon, alloy and stainless. We regularly flame-cut plate to 10″ thick, in simple or intricate shapes, to any size—from a single piece to 5,000 or more from one pattern.

**Quality Controlled**—Rigid controls govern every step, from plate specs. to pattern making and accurate cutting.

**Flame Cutting Is Economical**—Flame-cut shapes often replace forgings, castings or stampings—cut so accurately that practically no finishing operations are required.

**A Blue Print or Sketch** with clearly marked dimensions is all that's needed for prompt handling of your requirements.

*Above*—A forging? No. This part was flame cut from steel plate.
*At right*—Rigid sprockets cut from 1½″ plate.
*Below*—Accurate cutting means less machining.

# *Plates*

*Flame Cutting Service...28*

**Universal Mill Edge**.....30

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**Perforated**.....*Refer to Sheet Section*

**Stainless**.....*Refer to Stainless Section*

**E 8615**.....*Refer to Alloy Section*

## UNIVERSAL MILL EDGE PLATES

HOT ROLLED—OPEN HEARTH

Thicknesses up to 1½" incl. conform to ASTM A7-53T
Thicknesses over 1½" are .20 to .30 Carbon Killed Steel

*For 8" widths and narrower, refer to Hot Rolled Flats*

NOTE: Sizes 14" and wider are produced by shearing from Sheared Plate stock at no extra cost. Sheared Plates are not produced to ASTM A7-53T.

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Ft. |
|---|---|---|
| 1/4x 9 | 7.65 | 20 |
| 10 | 8.50 | 30 |
| 12 | 10.20 | 30 |
| 14 | 11.90 | 20 |
| 16 | 13.60 | 20 |
| 18 | 15.30 | 20 |
| 20 | 17.00 | 20 |
| 24 | 20.40 | 20 |
| 5/16x 9 | 9.56 | 20 |
| 10 | 10.63 | 20 |
| 12 | 12.75 | 20 |
| 14 | 14.88 | 20 |
| 16 | 17.00 | 20 |
| 18 | 19.13 | 20 |
| 20 | 21.25 | 20 |
| 24 | 25.50 | 20 |
| 3/8x 9 | 11.48 | 20 |
| 10 | 12.75 | 30 |
| 12 | 15.30 | 30 |
| 14 | 17.85 | 20 |
| 16 | 20.40 | 20 |
| 18 | 22.95 | 20 |
| 20 | 25.50 | 20 |
| 24 | 30.60 | 20 |
| 1/2x 9 | 15.30 | 20 |
| 10 | 17.00 | 30 |
| 12 | 20.40 | 30 |
| 14 | 23.80 | 20 |
| 16 | 27.20 | 20 |
| 18 | 30.60 | 20 |
| 20 | 34.00 | 20 |
| 24 | 40.80 | 20 |
| 5/8x 9 | 19.13 | 20 |
| 10 | 21.25 | 20 |
| 5/8x12 | 25.50 | 20 |
| 14 | 29.75 | 20 |
| 16 | 34.00 | 20 |
| 18 | 38.25 | 20 |
| 20 | 42.50 | 20 |
| 24 | 51.00 | 20 |
| 3/4x 9 | 22.95 | 20 |
| 10 | 25.50 | 20 |
| 12 | 30.60 | 20 |
| 14 | 35.70 | 20 |
| 16 | 40.80 | 20 |
| 18 | 45.90 | 20 |
| 20 | 51.00 | 20 |
| 24 | 61.20 | 20 |
| 7/8x10 | 29.75 | 20 |
| 12 | 35.70 | 20 |
| 16 | 47.60 | 20 |
| 24 | 71.40 | 20 |
| 1 x 7 | 23.80 | 20 |
| 8 | 27.20 | 20 |
| 9 | 30.60 | 20 |
| 10 | 34.00 | 20 |
| 12 | 40.80 | 20 |
| 1¼x10 | 42.50 | 20 |
| 12 | 51.00 | 20 |
| 1½x10 | 51.00 | 20 |
| 12 | 61.20 | 20 |
| 1¾x 8 | 47.60 | 20 |
| 2 x 7 | 47.60 | 20 |
| 8 | 54.40 | 20 |
| 9 | 61.20 | 20 |
| 10 | 68.00 | 20 |
| 12 | 81.60 | 20 |
| 2¼x 9 | 68.85 | 20 |

**Pickled and Oiled Steel Plates** are furnished from any hot rolled plate. Suitable for jigs, fixtures, pattern work, etc.

**Steel Circles and Rings**—We'll cut steel circles and rings to your specifications from any sheet or plate listed in this book. Rough forged and rough turned rings are also furnished. Your inquiries and orders are always welcome.

# SHEARED PLATES

## HOT ROLLED—OPEN HEARTH

*Particularly suitable for welding and forming*

Thicknesses up to 5/8" incl. are .10 to .20 Carbon
Thicknesses 3/4" thru 1 1/2" are .20 to .30 Carbon
Thicknesses over 1 1/2" are .20 to .30 Carbon Killed Steel

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Ft. |
|---|---|---|
| **3/16**x 7 to 12—*See H.R. Strip* | | |
| 14 to 72—*See H.R. Sheets* | | |
| 84 | 53.55 | 30 |
| 96 | 61.20 | St.L. |
| **1/4**x30 | 25.50 | 30 |
| 36 | 30.60 | 30 |
| 42 | 35.70 | 30 |
| 48 | 40.80 | 30 |
| 54 | 45.90 | 30 |
| 60 | 51.00 | 30 |
| 72 | 61.20 | 30 |
| 84 | 71.40 | 30 |
| 96 | 81.60 | 30 |
| 120 | 102.00 | 30 |
| **5/16**x30 | 31.88 | 30 |
| 36 | 38.25 | 30 |
| 42 | 44.63 | 30 |
| 48 | 51.00 | 30 |
| 54 | 57.38 | 30 |
| 60 | 63.75 | 30 |
| 72 | 76.50 | 30 |
| 84 | 89.25 | 30 |
| 96 | 102.00 | 30 |
| 120 | 127.50 | 30 |
| **3/8**x30 | 38.25 | 30 |
| 36 | 45.90 | 30 |
| 42 | 53.55 | 30 |
| 48 | 61.20 | 30 |
| 54 | 68.85 | 30 |
| 60 | 76.50 | 30 |
| 72 | 91.80 | 30 |
| 84 | 107.10 | 30 |
| 96 | 122.40 | 30 |
| 120 | 153.00 | 30 |
| **7/16**x30 | 44.63 | 30 |
| 36 | 53.55 | 30 |
| 42 | 62.48 | 30 |
| 48 | 71.40 | 30 |
| 54 | 80.33 | 30 |
| 60 | 89.25 | 30 |
| 72 | 107.10 | 30 |
| 84 | 125.00 | 30 |
| **1/2**x30 | 51.00 | 30 |
| 36 | 61.20 | 30 |
| 42 | 71.40 | 30 |
| 48 | 81.60 | 30 |
| 54 | 91.80 | 30 |
| 60 | 102.00 | 30 |
| 72 | 122.40 | 30 |
| 84 | 142.80 | 30 |
| 96 | 163.20 | 30 |
| 120 | 204.00 | 30 |
| **9/16**x30 | 57.38 | 30 |
| 36 | 68.85 | 30 |
| 42 | 80.33 | 30 |
| 48 | 91.80 | 30 |
| 60 | 114.75 | 30 |
| 72 | 137.70 | 30 |
| 84 | 160.70 | 30 |

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Ft. |
|---|---|---|
| **5/8**x30 | 63.75 | 30 |
| 36 | 76.50 | 30 |
| 42 | 89.25 | 20 |
| 48 | 102.00 | 30 |
| 60 | 127.50 | 30 |
| 72 | 153.00 | 30 |
| 84 | 178.50 | 20 |
| 96 | 204.00 | 30 |
| **3/4**x30 | 76.50 | 30 |
| 36 | 91.80 | 30 |
| 42 | 107.10 | 20 |
| 48 | 122.40 | 30 |
| 60 | 153.00 | 30 |
| 72 | 183.60 | 30 |
| 84 | 214.20 | 20 |
| 96 | 244.80 | 30 |
| **7/8**x58 | 172.60 | N.Y. |
| 60 | 178.50 | 30 |
| 72 | 214.20 | 30 |
| 84 | 249.90 | 30 |
| 96 | 285.60 | Det. |
| **1** x60 | 204.00 | 30 |
| 72 | 244.80 | 30 |
| 84 | 285.60 | 25 |
| 96 | 326.40 | 30 |
| **1 1/8** x72 | 275.40 | St.L. |
| 84 | 321.30 | 20 |
| 96 | 367.20 | Det. |
| **1 1/4** x72 | 306.00 | St.L. |
| 84 | 357.00 | 21 |
| 96 | 408.00 | 29 |
| **1 3/8** x72 | 336.60 | St.L. |
| 84 | 392.70 | 19 |
| 96 | 448.80 | Det. |
| **1 1/2** x84 | 428.40 | 17 |
| 96 | 489.60 | 24 |
| **1 5/8** x84 | 464.10 | 16 |
| **1 3/4** x84 | 499.80 | 15 |
| **2** x84 | 571.20 | 13 |
| **2 1/4** x84 | 642.60 | 12 |
| **2 1/2** x84 | 714.00 | 11 |
| **2 3/4** x84 | 785.40 | 20 |
| **3** x84 | 856.80 | 20 |
| **3 1/4** x84 | 928.20 | 20 |
| **3 1/2** x84 | 999.60 | 20 |
| **3 3/4** x84 | 1071.00 | 20 |
| **4** x84 | 1142.40 | 20 |
| **4 1/4** x84 | 1213.80 | Clev. |
| **4 1/2** x84 | 1285.20 | 20 |
| **5** x84 | 1428.00 | 20 |
| **5 1/2** x84 | 1570.80 | 19 |
| **6** x84 | 1713.60 | 17 |
| **6 1/2** x84 | 1856.40 | 15 |
| **7** x84 | 1999.20 | 14 |
| **7 1/2** x84 | 2142.00 | Clev. |
| **8** x84 | 2284.80 | 12 |
| **8 1/2** x84 | 2427.60 | Clev. |
| **9** x72 | 2203.20 | Clev. |
| **10** x84 | 2856.00 | 10 |

## HIGH CARBON STEEL PLATES

**.40 to .50 Carbon-Killed Steel**

HOT ROLLED—OPEN HEARTH

Identification Color: Yellow

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Ft. |
|---|---|---|
| **3/16**x48 to 60—*See Sheets* | | |
| 72 | 45.90 | Det. |
| 84 | 53.55 | N.Y. |
| **1/4**x30 | 25.50 | 30 |
| 36 | 30.60 | 30 |
| 42 | 35.70 | 30 |
| 48 | 40.80 | 30 |
| 54 | 45.90 | 30 |
| 60 | 51.00 | 30 |
| 72 | 61.20 | 30 |
| 84 | 71.40 | 30 |
| **5/16**x30 | 31.88 | 30 |
| 36 | 38.25 | 30 |
| 42 | 44.63 | 30 |
| 48 | 51.00 | 30 |
| 54 | 57.38 | 30 |
| 60 | 63.75 | 30 |
| 72 | 76.50 | 30 |
| 84 | 89.25 | 30 |
| **3/8**x30 | 38.25 | 30 |
| 36 | 45.90 | 30 |
| 42 | 53.55 | 30 |
| 48 | 61.20 | 30 |
| 54 | 68.85 | 30 |
| 60 | 76.50 | 30 |
| 72 | 91.80 | 30 |
| 84 | 107.10 | 30 |
| **7/16**x30 | 44.63 | 30 |
| 36 | 53.55 | 30 |
| 42 | 62.48 | 30 |
| 48 | 71.40 | 30 |
| 54 | 80.33 | 30 |
| 60 | 89.25 | 30 |
| 72 | 107.10 | 30 |
| 84 | 125.00 | 30 |
| **1/2**x30 | 51.00 | 30 |
| 36 | 61.20 | 30 |
| 42 | 71.40 | 30 |
| 48 | 81.60 | 30 |
| 54 | 91.80 | 30 |
| 60 | 102.00 | 30 |
| 72 | 122.40 | 30 |
| 84 | 142.80 | 30 |

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Ft. |
|---|---|---|
| **5/8**x30 | 63.75 | 30 |
| 36 | 76.50 | 30 |
| 42 | 89.25 | 30 |
| 48 | 102.00 | 30 |
| 60 | 127.50 | 30 |
| 72 | 153.00 | 30 |
| 84 | 178.50 | 30 |
| **3/4**x30 | 76.50 | 30 |
| 36 | 91.80 | 30 |
| 42 | 107.10 | 30 |
| 48 | 122.40 | 30 |
| 60 | 153.00 | 30 |
| 72 | 183.60 | 30 |
| 84 | 214.20 | 30 |
| **7/8**x60 | 178.50 | 30 |
| 72 | 214.20 | 30 |
| 84 | 249.90 | 30 |
| **1** x60 | 204.00 | 25 |
| 72 | 244.80 | 25 |
| 84 | 285.60 | 25 |
| **1⅛** x84 | 321.30 | 20 |
| **1¼** x84 | 357.00 | 21 |
| **1⅜** x84 | 392.70 | 19 |
| **1½** x84 | 428.40 | 20 |
| **1⅝** x84 | 464.10 | 20 |
| **1¾** x84 | 499.80 | 20 |
| **2** x84 | 571.20 | 20 |
| **2¼** x84 | 642.60 | 20 |
| **2½** x84 | 714.00 | 20 |
| **2¾** x84 | 785.40 | 20 |
| **3** x84 | 856.80 | 20 |
| **3¼** x84 | 928.20 | 20 |
| **3½** x84 | 999.60 | 20 |
| **3¾** x84 | 1071.00 | 20 |
| **4** x84 | 1142.40 | 20 |
| **4½** x84 | 1285.20 | 20 |
| **5** x84 | 1428.00 | 20 |
| **5½** x84 | 1570.80 | 18 |
| **6** x84 | 1713.60 | 17 |
| **6½** x84 | 1856.40 | Clev. |
| **7** x84 | 1999.20 | 14 |
| **8** x84 | 2284.80 | 13 |

**NOTE:** We furnish High Carbon plates in all standard Universal Mill widths on a Net Weight basis.

## FLANGE QUALITY AND FIREBOX QUALITY STEEL PLATES

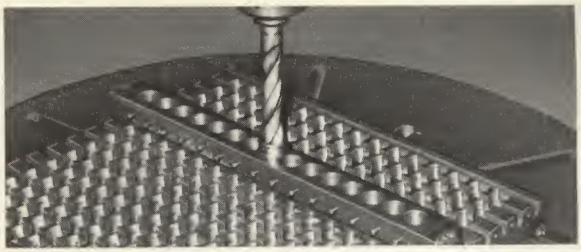
HOT ROLLED—OPEN HEARTH

Tensile Strength 55,000 to 65,000 psi

A.S.M.E. SA-285, Grade C • A.S.T.M. A-285-54T, Grade C

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | |
|---|---|---|---|
| | | Flange | Firebox |
| 1/4x48 | 40.80 | 30 | .. |
| 60 | 51.00 | .. | 30 |
| 72 | 61.20 | 30 | .. |
| 84 | 71.40 | 30 | .. |
| 96 | 81.60 | .. | 30 |
| 120 | 102.00 | 30 | .. |
| 5/16x60 | 63.75 | .. | 30 |
| 72 | 76.50 | 30 | .. |
| 84 | 89.25 | 30 | .. |
| 96 | 102.00 | .. | 30 |
| 120 | 127.50 | 30 | .. |
| 3/8x48 | 61.20 | 30 | .. |
| 60 | 76.50 | .. | 30 |
| 72 | 91.80 | .. | 30 |
| 84 | 107.10 | 30 | .. |
| 96 | 122.40 | .. | 30 |
| 120 | 153.00 | 30 | .. |
| 7/16x84 | 124.95 | 30 | .. |
| 120 | 178.50 | .. | 30 |
| 1/2x48 | 81.60 | 30 | .. |
| 60 | 102.00 | .. | 30 |
| 72 | 122.40 | 30 | .. |
| 84 | 142.80 | 30 | .. |
| 96 | 163.20 | .. | 30 |
| 120 | 204.00 | .. | 30 |
| 5/8x60 | 127.50 | 30 | .. |
| 84 | 178.50 | 30 | .. |
| 96 | 204.00 | .. | 30 |
| 120 | 255.00 | .. | 30 |
| 3/4x60 | 153.00 | 30 | .. |
| 84 | 214.20 | 30 | .. |
| 120 | 306.00 | .. | 30 |
| 7/8x84 | 249.90 | 30 | .. |
| 120 | 357.00 | .. | 30 |
| 1 x84 | 285.60 | 25 | .. |
| 120 | 408.00 | .. | 38 |
| 1⅛ x84 | 321.30 | 20 | .. |
| 1¼ x84 | 357.00 | 20 | .. |
| 1½ x84 | 428.40 | 20 | .. |
| 1¾ x84 | 499.80 | 20 | .. |
| 2 x84 | 571.20 | Phil.20 | .. |

**NOTE:** We furnish Flange and Firebox Quality Plates in all standard Universal Mill widths and Sheared Widths on a Net Weight basis.



E-Z Cut plates drill and cut faster, producing a cleaner, smoother surface.

## E-Z-CUT® PLATE

### FREE MACHINING—CASE HARDENING

E-Z Cut plates are made from a special high manganese steel: Remarkable free machining qualities make them ideal for die bases, jigs, rubber molds, etc.—where considerable machining is involved.

The cutting is clean with less friction. Tool life is lengthened. Savings in machining time amount to as much as 30% compared to ordinary steel, with approximately 50% increase in life of cutting tool.

E-Z-Cut Plates respond to all carburizing processes, attaining a uniformly deep and hard case. Strong, sound welds result when proper techniques and electrodes are used.

**New E-Z-Cut** is the latest development in free machining plate. It is a remarkably sound and clean steel with superior machinability made possible by a small lead addition. Machined surfaces are better and are readily polished to the required finish.

New E-Z-Cut is easily welded. Adequate ventilation when welding is recommended.

**NEW E-Z-CUT PLATE** Identification Color: Purple

In addition to the sizes listed below, we furnish the following widths at the stock size price: ⅜ to ¾" thick—36, 48, 60, 72"

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet |
|---|---|---|---|---|---|
| ⅜x84 | 107.1 | 20 | 1½x84 | 428.4 | 20 |
| ½x84 | 142.8 | 20 | 1⅝x84 | 464.1 | 20 |
| ⅝x84 | 178.5 | 20 | 1¾x84 | 499.8 | 20 |
| ¾x84 | 214.2 | 20 | 1⅞x84 | 535.5 | Clev. |
| ⅞x84 | 249.9 | 20 | 2 x84 | 571.2 | 20 |
| 1 x84 | 285.6 | 20 | 2¼x84 | 642.6 | 20 |
| 1⅛x84 | 321.3 | 20 | 2½x84 | 714.0 | 20 |
| 1¼x84 | 357.0 | 20 | 2¾x84 | 785.4 | 20 |
| 1⅜x84 | 392.7 | 20 | 3 x84 | 856.8 | 20 |

**E-Z-CUT PLATE** Identification Color: Gold

| | | | | | |
|---|---|---|---|---|---|
| 3¼x84 | 928.20 | 20 | 4¾x84 | 1356.60 | 20 |
| 3½x84 | 999.60 | 20 | 5 x84 | 1428.00 | 20 |
| 3¾x84 | 1071.00 | 20 | 5½x84 | 1570.80 | 20 |
| 4 x84 | 1142.40 | 20 | 6 x84 | 1712.60 | 17 |
| 4¼x84 | 1213.80 | 20 | 7 x84 | 1999.20 | 15 |
| 4½x84 | 1284.20 | 20 | 8 x84 | 2284.80 | 13 |

**NOTE:** We furnish E-Z-Cut plates in all standard Universal Mill widths on a Net Weight basis.

## HI-STEEL® PLATES

***High Strength—Low Alloy—Abrasion and Corrosion Resisting***

HOT ROLLED—OPEN HEARTH

Conforms to SAE Specification 950

Inland Hi-Steel is a low alloy, high strength steel, high in resistance to abrasion and atmospheric corrosion. Its reasonably low cost permits wide use in place of regular open-hearth carbon steel, reducing dead weight and extending the life of service equipment.

The many applications include: railroad cars, trucks, trailers, cranes, excavating machinery, and other mobile equipment in which it is desired to reduce dead weight, increase payload, add strength and safety, and extend service life. Write for bulletin.

### Typical Mechanical Properties

| | Thickness Ranges | | | |
|---|---|---|---|---|
| | Under 3/16" | 3/16" to 3/4" Incl. | Over 3/4" to 1" Incl. | Over 1" to 2" Incl. |
| Yield Point psi | 52,500 min. | 50,000 min. | 50,000 min. | 50,000 min. |
| Tensile Strength psi | 70,000 min. | 70,000 min. | 70,000 min. | 70,000 min. |
| % Elong. 2" | 22 min. | | | 22 min. |
| % Elong. 8" | | 1,500,000 T.S. | 1,500,000 T.S. | 1,500,000 T.S. |

### Other Properties

| | |
|---|---|
| Resistance to atmospheric corrosion | 4 to 5 times carbon steel |
| Ultimate compressive strength, psi | Equal to tensile strength |
| Ultimate shear strength, psi | Equal to 3/4 tensile strength |
| Modulus of elasticity, psi | 28,000,000 to 30,000,000 |
| Endurance limit, psi | 49,000 |
| Charpy Impact (as rolled), keyhole notch, at room temperature in lbs. per foot | Average 50 |

### Fabricating Practice for Cold Forming

| Thickness of Material | Recommended Min. Inside Radius |
|---|---|
| Up to 1/16" Incl. | 1 x thickness |
| Over 1/16" to 1/4" Incl. | 2 x thickness |
| Over 1/4" | 3 x thickness |

Cold forming can be done with standard equipment; Hi-Steel may also be punched, sheared, and welded as easily as regular carbon steel. Hot forming does not affect physical properties. Simple heat treatment gives greatly increased mechanical properties.

Identification Color: White

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet |
|---|---|---|---|---|---|
| 3/16x48 & 60—*See Sheets* | | | 3/8x48 | 61.20 | 30 |
| 72 | 45.90 | St.L. | 72 | 91.80 | 30 |
| 1/4x48 | 40.80 | 30 | 84 | 107.10 | 30 |
| 72 | 61.20 | 30 | 1/2x48 | 81.60 | 30 |
| 84 | 71.40 | 30 | 72 | 122.40 | 30 |
| 5/16x48 | 51.00 | 30 | 84 | 142.80 | 30 |
| 72 | 76.50 | 30 | 5/8x84 | 178.50 | 30 |
| 84 | 89.25 | 30 | 3/4x84 | 214.20 | 30 |

**NOTE:** We furnish Hi-Steel Plates in all standard Universal Mill widths and Sheared widths on a Net Weight basis.

## ABRASION RESISTING PLATES & SHEETS

Identification Color: Aluminum

Ryerson abrasion resisting steel is made to a special carbon-manganese specification, developed especially for applications requiring resistance to abrasive wear. It is used in making scraper blades, grain and feed mill liners and spouts, concrete mixers, conveyors, hammer mill parts, drag line equipment, coal and gravel screens and chutes, sand, gravel, cement and clay handling machinery, pug mill knives, etc.

Abrasion resisting steel will in most cases outlast ordinary steel by a big margin and it often compares favorably with high priced alloy castings. The actual comparative life is of course dependent on the application, method of fabrication and whether used in the natural or heat treated condition.

Abrasion resisting sheets and plates can be machined, drilled and punched. They will also withstand a certain amount of bending and forming.

If you will give us the details of your abrasion problem our steel specialists will make recommendations on the fabrication and use of this material for your application.

*Send for descriptive bulletin*

### PLATES

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Ft. | Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Ft. |
|---|---|---|---|---|---|
| **1/4** (10.20 Lbs. Sq. Ft.) | | | **3/8** (15.30 Lbs. Sq. Ft.) | | |
| 48 | 40.80 | 30 | 84 | 107.10 | 30 |
| 60 | 51.00 | 30 | **1/2** (20.40 Lbs. Sq. Ft.) | | |
| 84 | 71.40 | 30 | 84 | 142.80 | 30 |
| | | | *5/8 (25.50 Lbs. Sq. Ft.) | | |
| **5/16** (12.75 Lbs. Sq. Ft. | | | 84 | 178.50 | 30 |
| 84 | 89.25 | 30 | *3/4 (30.60 Lbs. Sq. Ft.) | | |
| | | | 84 | 214.20 | 30 |

* 5/8 and 3/4" Plate is Flame Cut to size. Lighter thicknesses are Sheared.

**NOTE:** We furnish Abrasion Resisting Plates in all standard Universal Mill widths and Sheared widths on a Net Weight basis.

### SHEETS

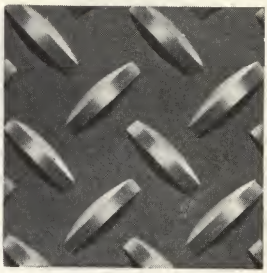
| U.S.S. Gauge and Size in Inches | Wt. per Ft. in Lbs. | Est. Wt. per Sheet in Lbs. | U.S.S. Gauge and Size in Inches | Wt. per Ft. in Lbs. | Est. Wt. per Sheet in Lbs. |
|---|---|---|---|---|---|
| **7 Ga.** (3/16") 7.50 | | | **10 Ga.** (.1345") 5.625 | | |
| 48x192 | | 480.0 | 48x240 Buff. | | 450.0 |
| 48x360 Buff. | | 900.0 | 60x192 | | 450.0 |
| 60x240 | | 750.0 | 72x192 St.L. | | 540.0 |
| 72x240 | | 900.0 | **16 Ga.** (.0598") 2.50 | | |
| **10 Ga.** (.1345") 5.625 | | | 36x 96 | | 60.0 |
| 48x192 | | 360.0 | 48x120 | | 100.0 |

**Manganal Steel Plate** is an 11 to 13½% Manganese-Nickel steel. This special analysis attains a high surface hardness by work hardening while in use and yet retains good ductility. Its excellent resistance to wear and abrasion make it suitable for use in gravel and stone chutes, conveyors, crusher liners, shot blasting cabinets, wear plates, etc. Manganal is available in ¼" to 1" plate and other shapes. Call us for more information or write for our descriptive bulletin giving further details including suggestions for fabrication.

# INLAND 4-WAY® SAFETY PLATES

(½ Actual Size)

**Large Pattern** • Recommended for floors that must withstand abuse and heavy loads.



**Medium Pattern** • A popular, versatile pattern for use in your plant or on your product.

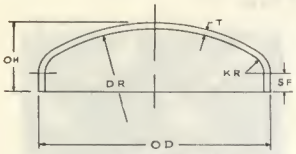
This tough, rolled steel floor plate with raised lug pattern provides plenty of traction for feet and wheels. The attractive design permits free drainage and easy maintenance since there are no pockets to collect dirt and grease and no pores to absorb liquids. Easy to fabricate and install.

*Write for descriptive bulletin.*

| *Nom. Ga. and Size in Inches | Wt. per Lineal Ft. in Lbs. | Stock Lengths in Feet |
|---|---|---|
| **Large Pattern** | | |
| **3/16** (8.70 Lbs. Sq. Ft.) | | |
| 30 | 21.75 | 30 |
| 36 | 26.10 | 20 |
| 42 | 30.45 | 30 |
| 48 | 34.80 | 30 |
| 54 | 39.15 | 30 |
| 60 | 43.50 | 30 |
| 72 | 52.20 | 30 |
| **1/4** (11.25 Lbs. Sq. Ft.) | | |
| 30 | 28.13 | 30 |
| 36 | 33.75 | 20 |
| 42 | 39.38 | 30 |
| 48 | 45.00 | 30 |
| 54 | 50.62 | 30 |
| 60 | 56.25 | 30 |
| 72 | 67.50 | 30 |
| **5/16** (13.80 Lbs. Sq. Ft.) | | |
| 30 | 34.50 | 30 |
| 36 | 41.40 | 30 |
| 42 | 48.30 | 30 |
| 48 | 55.20 | 30 |
| **5/16** (13.80 Lbs. Sq. Ft.) | | |
| 54 | 62.10 | 30 |
| 60 | 69.00 | 30 |
| 72 | 82.80 | 30 |
| **3/8** (16.35 Lbs. Sq. Ft.) | | |
| 30 | 40.88 | 30 |
| 36 | 49.05 | 30 |
| 42 | 57.23 | 30 |
| 48 | 65.40 | 30 |
| 60 | 81.75 | 30 |
| 72 | 98.10 | 30 |
| **1/2** (21.45 Lbs. Sq. Ft.) | | |
| 30 | 53.63 | 30 |
| 36 | 64.35 | 30 |
| 42 | 75.08 | 30 |
| 48 | 85.80 | 30 |
| 60 | 107.25 | 30 |
| 72 | 128.70 | 30 |
| **5/8** (26.55 Lbs. Sq. Ft.) | | |
| 72 | 159.30 | N.Y. |
| **Medium Pattern** | | |
| **16 Ga.** (3.00 Lbs. Sq. Ft.) | | |
| 30 | 7.50 | Buff.8 |
| 36 | 9.00 | 8,10,12 |
| 48 | 12.00 | 8,16 |
| **14 Ga.** (3.95 Lbs. Sq. Ft.) | | |
| 36 | 11.25 | 8,10,12 |
| 42 | 13.82 | N.Y.12 |
| 48 | 15.00 | 10 |
| **12 Ga.** (5.25 Lbs. Sq. Ft.) | | |
| 36 | 15.75 | 10,20 |
| 48 | 21.00 | 10,20 |
| 60 | 26.25 | 10,20 |
| **1/8"** (6.15 Lbs. Sq. Ft.) | | |
| 36 | 18.45 | 10,20 |
| 48 | 24.60 | 10,20 |
| 60 | 30.75 | 10,20 |

* Thickness exclusive of projecting lugs.

## HEADS




**ASME TYPE** **STANDARD TYPE**

*Immediate Shipment From Chicago Stock*

**ASME TYPE** Made from ASTM A285-54T Grade C flange quality steel. High Crown (deep dished). Straight flange on all ASME Heads.

| Size O.D. in Inches T OD | Overall Height in Inches OH | Depth Dish in Inches DD | Knuckle Radius in Inches KR | Dish Radius in Inches DR | Work Press.* in Lbs. per Sq. In. WP | Wt. Each in Lbs. W |
|---|---|---|---|---|---|---|
| 1/4x24 | 6 1/4 | 4 | 1 1/2 | 24 | 137.6 | 52 |
| 30 | 8 1/4 | 6 | 1 7/8 | 24 | 137.6 | 76 |
| 36 | 9 1/4 | 7 | 2 1/4 | 30 | 110.0 | 106 |
| 42 | 10 1/4 | 8 | 2 5/8 | 36 | 91.7 | 142 |
| 48 | 11 1/8 | 8 7/8 | 2 7/8 | 42 | 78.6 | 181 |
| 5/16x24 | 6 7/8 | 4 5/16 | 1 1/2 | 20 | 206.3 | 65 |
| 30 | 8 5/16 | 6 | 1 7/8 | 24 | 171.9 | 95 |
| 36 | 9 1/4 | 6 15/16 | 2 1/4 | 30 | 137.5 | 132 |
| 42 | 10 1/4 | 7 15/16 | 2 5/8 | 36 | 114.6 | 176 |
| 48 | 11 3/16 | 8 7/8 | 2 7/8 | 42 | 98.3 | 225 |
| 3/8x24 | 6 1/4 | 3 7/8 | 1 1/2 | 24 | 206.3 | 77 |
| 30 | 8 1/4 | 5 7/8 | 1 7/8 | 24 | 206.3 | 114 |
| 36 | 9 1/4 | 6 7/8 | 2 1/4 | 30 | 165.1 | 158 |
| 42 | 10 1/4 | 7 7/8 | 2 5/8 | 36 | 137.6 | 210 |
| 48 | 11 5/16 | 8 15/16 | 2 7/8 | 42 | 117.9 | 269 |
| 60 | 13 1/4 | 10 7/8 | 3 5/8 | 54 | 91.7 | 409 |
| 1/2x24 | 6 3/8 | 3 7/8 | 1 1/2 | 24 | 275.1 | 102 |
| 30 | 8 5/16 | 5 13/16 | 1 7/8 | 24 | 275.1 | 151 |
| 36 | 9 5/16 | 6 13/16 | 2 1/4 | 30 | 220.1 | 210 |
| 42 | 10 5/16 | 7 13/16 | 2 5/8 | 36 | 183.4 | 278 |
| 48 | 11 1/4 | 8 3/4 | 2 7/8 | 42 | 157.2 | 356 |
| 60 | 13 1/4 | 10 3/4 | 3 5/8 | 54 | 122.3 | 542 |

**STANDARD TYPE** Made from Hot Rolled pressing quality steel.

| Size O.D. in Inches T OD | Straight Flange in Inches SF | Overall Height in Inches OH | Depth Dish in Inches DD | Knuckle Radius in Inches KR | Dish Radius in Inches DR | Wt. Each in Lbs. W |
|---|---|---|---|---|---|---|
| 3/16x18 | 1 | 3 11/16 | 2 1/2 | 3/8 | 18 | 18 |
| 20 | 1 | 4 | 2 13/16 | 3/8 | 20 | 22 |
| 24 | 1 1/2 | 5 | 3 5/16 | 3/8 | 24 | 32 |
| 30 | 1 1/2 | 5 13/16 | 4 1/8 | 3/8 | 30 | 49 |

* Working pressures calculated by ASME 1949 Code Rules with pressure on concave side and in temperature range of minus 20 to plus 650° F., 55,000 lb. T.S. Factor of safety 5. Working stress 11,000 lbs. One piece heads.

## HEADS MADE TO ORDER

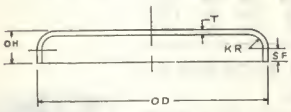
**Carbon and Stainless Steel**

Besides the Flanged and Dished Heads carried in stock, we supply most any other type you need: Flanged Only, Dished Only, Cover Heads, Semi-Elliptical, Reverse Dished, Shallow Flanged and Dished, Obround Double Dished or Obround Flanged Only. These can be hot pressed, hot spun, cold pressed or lathe spun.

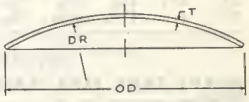
In sending in your order for these special heads be sure to include the following information:

1. Quantity.
2. Thickness.
3. Outside Diameter.
4. Type (ASME-API or Standard Flanged and Dished, Flanged Only, Dished Only, Cover Heads, etc.).
5. Length of straight portion of flange.
6. Trimming of flange, if required.
7. Grade of steel.
8. Location of manhole and openings, if required.

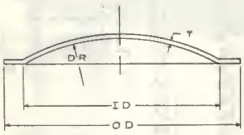
**FLANGED ONLY**




**DISHED ONLY**




**COVER HEAD**




**KEY**

O.D. . . . . Outside Diameter
I.D. . . . . Inside Diameter
T. . . . . Thickness
S.F. . . . . Straight Flange
O.H. . . . . Overall Height
K.R. . . . . Knuckle Radius
D.R. . . . . Dish Radius

## MANHOLE COVERS WITH FITTINGS

Ryerson Manhole Covers are pressed from ASTM A-285 Grade C quality steel, and conform to ASME code requirements. Each cover is furnished complete with pressed steel arches, machine bolts and gasket. Forged rings can also be furnished for low pressure applications.

## MANHOLE SADDLES

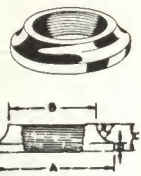
Manhole Saddles are made in all standard sizes $\frac{3}{8}$" to $1\frac{5}{8}$" thick and curved to fit shells or heads. When ordering, you may find helpful the added information in *The Ryerson Steel Data Book.*

# WELDING FLANGES

Drop Forged Steel

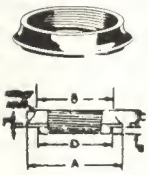
All welding flanges carried threaded from top

## EXTRA HEAVY FLAT FLANGES



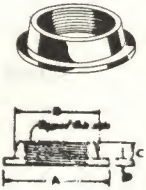
| No. | Pipe Size, In. | A, In. | B, In. | C, In. | D, In. | R, In. | Wt. Lbs. per 100 |
|---|---|---|---|---|---|---|---|
| 176 | ¾ | 2¼ | 1½ | ¾ | ¼ | 7/16 | 45 |
| 177 | 1 | 2½ | 1¾ | ¾ | ¼ | ½ | 52 |
| 178 | 1¼ | 2⅞ | 2 1/16 | ¾ | ¼ | 9/16 | 66 |
| 179 | 1½ | 3¼ | 2⅜ | ¾ | ¼ | ⅝ | 83 |
| 180 | 2 | 3¾ | 2⅞ | ¾ | ¼ | 1 1/16 | 113 |
| 181 | 2½ | 4¼ | 3½ | 1 | ¼ | ¾ | 153 |
| 182 | 3 | 5½ | 4¼ | 1 | ¼ | 1 3/16 | 275 |
| 183 | 3½ | 6 | 4⅞ | 1 | ¼ | ⅞ | 335 |
| 184 | 4 | 6½ | 5⅜ | 1⅛ | ¼ | 1 5/16 | 392 |

## STANDARD HEAVY FLAT FLANGES



| No. | Pipe Size, In. | A, In. | B, In. | C, In. | D, In. | E, In. | F, In. | Wt. Lbs. per 100 |
|---|---|---|---|---|---|---|---|---|
| 250 | ⅛ | 1⅜ | ⅞ | ⅜ | 27/32 | 3/32 | 3/64 | 9 |
| 251 | ¼ | 1½ | 1 | ⅜ | 31/32 | ⅛ | 3/64 | 10 |
| 252 | ⅜ | 1⅝ | 1 1/16 | ⅜ | 31/32 | ⅛ | 3/64 | 11 |
| 253 | ½ | 1 13/16 | 1 5/16 | 7/16 | 1 5/32 | 5/32 | 3/64 | 16 |
| 254 | ¾ | 2 1/16 | 1 7/16 | ½ | 1 11/32 | 5/32 | 1/16 | 24 |
| 255 | 1 | 2 5/16 | 1¾ | 19/32 | 1 23/32 | 3/16 | 1/16 | 36 |
| 256 | 1¼ | 2 11/16 | 2⅛ | 9/16 | 1 15/16 | 3/16 | 1/16 | 41 |
| 257 | 1½ | 3 1/32 | 2⅜ | 9/16 | 2 5/16 | 3/16 | 1/16 | 53 |
| 258 | 2 | 3½ | 2⅞ | ⅝ | 2 11/16 | 3/16 | 1/16 | 72 |
| 259 | 2½ | 4 1/16 | 3 5/16 | 13/16 | 3 3/16 | 3/16 | 3/32 | 108 |
| 260 | 3 | 4⅝ | 3 15/16 | 13/16 | 3 11/16 | 3/16 | 3/32 | 120 |
| 261 | 3½ | 5⅛ | 4 7/16 | 13/16 | 4 3/16 | 3/16 | 3/32 | 147 |
| 262 | 4 | 5 13/16 | 4 15/16 | 15/16 | 4¾ | 3/16 | ⅛ | 191 |

## HEAVY TANK FLAT FLANGES



| No. | Pipe Size, In. | A, In. | B, In. | C, In. | D, In. | Wt. Lbs. per 100 |
|---|---|---|---|---|---|---|
| 101 | ¼ | 1¼ | ¾ | 5/16 | ⅛ | 5 |
| 102 | ⅜ | 1⅜ | 1 5/16 | ⅜ | ⅛ | 6 |
| 103 | ½ | 1½ | 1⅛ | 7/16 | ⅛ | 8 |
| 104 | ¾ | 1¾ | 1⅜ | ⅝ | ⅛ | 15 |
| 105 | 1 | 2⅛ | 1 11/16 | ⅝ | 5/32 | 24 |
| 106 | 1¼ | 2½ | 2 | 1 1/16 | 5/32 | 32 |
| 107 | 1½ | 3 | 2⅜ | ¾ | 5/32 | 50 |
| 108 | 2 | 3½ | 2⅞ | 1 3/16 | 5/32 | 66 |
| 109 | 2½ | 4¼ | 3½ | 1 | ¾ | 116 |
| 110 | 3 | 5 | 4⅛ | 1 | ¾ | 156 |
| 111 | 3½ | 5½ | 4⅝ | 1 1/16 | 7/32 | 188 |
| 112 | 4 | 6 | 5¾ | 1⅛ | ¼ | 228 |

## STANDARD HEAVY CURVED FLANGES

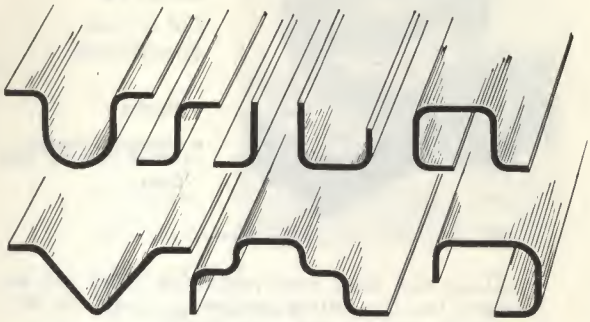
| No. | Pipe Size, In. | A, In. | B, In. | C, In. | D, In. | E, In. | R, In. | Wt. Lbs. per 100 |
|---|---|---|---|---|---|---|---|---|
| 152 | 1½ | 3⅛ | 2 13/32 | ¾ | ⅛ | 2 11/32 | 15 | 58 |
| 153 | 2 | 3⅝ | 2 13/16 | 13/16 | ⅛ | 2 23/32 | 15 | 78 |
| 154 | 2½ | 4¼ | 3 7/16 | 1 | ⅛ | 3 1/16 | 22 | 119 |
| 155 | 3 | 4⅞ | 4 3/32 | 1 | ⅛ | 3 11/16 | 22 | 147 |
| 156 | 3½ | 5⅜ | 4⅝ | 1 1/16 | 3/16 | 4 3/16 | 26 | 160 |
| 157 | 4 | 5 13/16 | 5⅛ | 1 3/16 | 3/16 | 4¾ | 26 | 211 |

## LARGE EXTRA HEAVY WELDING FLANGES

Flat or Curved • In our Chicago plant

| Size B, In. | A, In. | D, In. | C, In. | Wt., Lbs. |
|---|---|---|---|---|
| 5 | 7½ | 1½ | ½ | 7 |
| 6 | 8½ | 1½ | ½ | 8 |

## SPECIAL FORMED PARTS



We can furnish an unlimited selection of special parts formed from carbon and stainless steel and Aluminum sheets and plates. Primarily formed on pressbrake equipment, using standard Vee Dies on hand for all popular sheet and plate thicknesses. Where quantity warrants, special dies can be developed for more intricate sections.

Accuracy of forming is controlled by sheared width of blanks. Wherever possible, we suggest you order sections not over 12′ 0″ long, permitting single shearing operations. The usual inside bend radius equals the material thickness. In designing new products, we suggest minimum flange lengths not less than 6 times the metal thickness.

## RYERSON CURBING

**Lawn Curb**
3/16″ x 4″ High

**Road Curb**
1/4″ x 5″ High

A strong, flexible hot rolled steel strip for retaining neat and durable border separations. *Garden and Lawn Strip* is ideal for general landscape use, special-shaped plots, foot paths, truck gardens, nurseries, etc. The heavier and larger *Road and Curb Strip* is used for asphalt, gravel, crushed rock and black top walks and driveways in residential work, parking areas, bridle paths, estate driveways and shopping centers.

Connecting joints accommodate inclines as well as level surfaces. Ryerson Curbing forms neat sweeping curves and complete circles.

Installation is simple and speedy—held firmly in the ground by 18″ tapered steel stakes driven through pockets pressed into the side of the curbing at intervals of approximately two feet (7 stakes furnished with each length of curbing). Painted with extra heavy green paint in 20 foot lengths. Allowing for lap at joints, lengths lay 15′-4″.

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## SHEETS

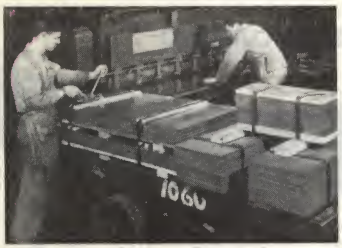
*Cut to your Specifications*

- **Blanks**
- **Straight Lengths**
- **Coils**

Whatever size sheet your production needs call for, Ryerson has the cutting equipment to do the job—quickly, dependably and economically.

1. Batteries of latest type shears enable us to cut blanks and strips quickly and accurately to meet your schedules.
2. Our giant slitters take large sheet coils and slit them into strip size coils.
3. Few steel service organizations can match our automatic cut-to-length lines which decoil, level and cut coil stock into flat sheets, blanks or strip in production quantities.

This modern Ryerson equipment is always ready to go to work for you. (We will gladly figure with you on shearing or slitting your own material.) And, of course, your orders and inquiries are always welcome.

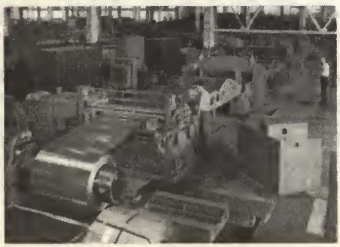


### SHEARING

To exact size—including square and rectangular blanks and sketches or strip in straight lengths.

### SLITTING—EDGING

Modern precision equipment slits sheet coils 3/16" thick and lighter up to 48" wide. ½ to 6" wide straight lengths and coils can be furnished edge rolled (comparable to No. 4 round edge flat wire).



### CUTTING TO LENGTH

Flat sheets 10 Gauge and lighter are accurately cut from coils on our modern cut-to-length line—in lengths to 16 feet—in widths to 72". Shear blade cuts upward, leaving burr up to minimize scratches.

# *Sheets*

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## HOT ROLLED SHEETS

**High Quality—Low Carbon—Open Hearth**

A high quality, economical mill edge sheet with good workability for forming operations. Used for tanks, barrels, pails, farm implements, discs, cabinets, lockers, truck bodies, household equipment, etc. For C. R. Sheets see pages 47, 48.

*For 12″ widths and narrower see Hot Rolled Strip on page 65.*

| U.S.S. or Mfrs. Ga. & Size, Inches | Wt. per Sq. Ft. | Est. Wt. per Sheet |
|---|---|---|
| **7 Ga.** (3/16″) | 7.50 | |
| 14x240* | | 8.75 |
| 16x240* | | 10.00 |
| 18x240* | | 11.25 |
| 20x240* | | 13.00 |
| 24x240* | | 15.00 |
| 30x240* | | 18.75 |
| 36x240* | | 22.50 |
| 42x240* | | 26.25 |
| 48x240* | | 30.00 |
| 54x240* | | 33.75 |
| 60x240* | | 37.50 |
| 72x240* | | 42.00 |
| Over 72″—see Plates | | |
| *Above weights are for one lineal foot of length.* | | |
| **8 Ga.** (.1644″) | 6.875 | |
| 30x120 | | 171.9 |
| 30x192 | | 275.0 |
| 36x 96 | | 165.0 |
| 36x120 | | 206.3 |
| 36x192 | | 330.0 |
| 42x120 | | 240.6 |
| 42x192 | | 385.0 |
| 48x120 | | 275.0 |
| 48x144 | | 330.0 |
| 48x192 | | 440.0 |
| 54x192 | | 495.0 |
| 60x120 | | 343.8 |
| 60x144 | | 412.5 |
| 60x192 | | 550.0 |
| 72x144 | | 495.0 |
| 72x192 | | 660.0 |
| **10 Ga.** (.1345″) | 5.625 | |
| 30x 96 | | 112.5 |
| 30x120 | | 140.6 |
| 36x 96 | | 135.0 |
| 36x120 | | 168.8 |
| 36x144 | | 202.5 |
| 42x 96 | | 157.5 |
| 42x120 | | 196.9 |
| 42x144 | | 236.3 |
| 48x 96 | | 180.0 |
| 48x120 | | 225.0 |
| 48x144 | | 270.0 |

| U.S.S. or Mfrs. Ga. & Size, Inches | Wt. per Sq. Ft. | Est. Wt. per Sheet |
|---|---|---|
| **10 Ga.** (.1345″) | 5.625 | |
| 54x 96 | | 202.5 |
| 54x120 | | 253.1 |
| 60x 96 | | 225.0 |
| 60x120 | | 281.3 |
| 60x144 | | 337.5 |
| 72x 96 | | 270.0 |
| 72x120 | | 337.5 |
| 72x144 | | 405.0 |
| 72x192 | | 540.0 |
| **11 Ga.** (.1196″) | 5.00 | |
| 30x 96 | | 100.0 |
| 30x120 | | 125.0 |
| 36x 96 | | 120.0 |
| 36x120 | | 150.0 |
| 42x 96 | | 140.0 |
| 42x120 | | 175.0 |
| 48x 96 | | 160.0 |
| 48x120 | | 200.0 |
| 48x144 | | 240.0 |
| 54x144 | | 270.0 |
| 60x 96 | | 200.0 |
| 60x120 | | 250.0 |
| 60x144 | | 300.0 |
| 72x120 | | 300.0 |
| 72x144 | | 360.0 |
| 72x192 | | 480.0 |
| **12 Ga.** (.1046″) | 4.375 | |
| 30x 96 | | 87.5 |
| 30x120 | | 109.4 |
| 36x 96 | | 105.0 |
| 36x120 | | 131.3 |
| 36x144 | | 157.5 |
| 42x 96 | | 122.5 |
| 42x120 | | 153.1 |
| 42x144 | | 183.8 |
| 48x 96 | | 140.0 |
| 48x120 | | 175.0 |
| 48x144 | | 210.0 |
| 48x156 | | 227.5 |
| 54x120 | | 196.9 |
| 54x192 | | 315.0 |
| 60x 96 | | 175.0 |
| 60x120 | | 218.8 |

(Continued)

* Stock sizes include 96, 120, 144 and 240″ lengths.

**Hot Rolled Coils** are regularly stocked in standard widths—intermediate widths can be slit to meet your requirements. We cut flat sheets from these coils to any length up to 16 feet on quantity orders. See page 49.

**Steel Circles and Rings** can be cut from any sheet or plate listed in this book. Rough forged and rough turned rings are also furnished. Write or call for more information.

## HOT ROLLED SHEETS, Continued

*For 12" widths and narrower see Hot Rolled Strip on page 65.*

| U.S.S. or Mfrs. Ga. & Size, Inches | Wt. per Sq. Ft. | Est. Wt. per Sheet |
|---|---|---|
| **12 Ga.** (.1046") | 4.375 | |
| 60x144 | | 262.5 |
| 60x168 | | 306.3 |
| 72x120 | | 262.5 |
| 72x192 | | 420.0 |
| **14 Ga.** (.0747") | 3.125 | |
| 30x 96 | | 62.5 |
| 30x120 | | 78.1 |
| 36x 96 | | 75.0 |
| 36x120 | | 93.8 |
| 36x144 | | 112.5 |
| 42x 96 | | 87.5 |
| 42x120 | | 109.4 |
| 42x144 | | 131.3 |
| 48x 96 | | 100.0 |
| 48x120 | | 125.0 |
| 48x144 | | 150.0 |
| 48x156 | | 162.5 |
| 54x120 | | 140.6 |
| 54x156 | | 182.8 |
| 60x 96 | | 125.0 |
| 60x120 | | 156.3 |
| 60x144 | | 187.5 |
| 60x192 | | 250.0 |
| **16 Ga.** (.0598") | 2.50 | |
| 28x120 | | 58.3 |
| 30x 96 | | 50.0 |
| **16 Ga.** (.0598") | 2.50 | |
| 30x120 | | 62.5 |
| 36x 96 | | 60.0 |
| 36x120 | | 75.0 |
| 36x144 | | 90.0 |
| 42x 96 | | 70.0 |
| 42x120 | | 87.5 |
| 42x144 | | 105.0 |
| 48x 96 | | 80.0 |
| 48x120 | | 100.0 |
| 48x144 | | 120.0 |
| 48x156 | | 130.0 |
| 54x 96 | | 90.0 |
| 54x120 | | 112.5 |
| 54x156 | | 146.3 |
| 60x 96 | | 100.0 |
| 60x120 | | 125.0 |
| 60x144 | | 150.0 |
| 60x168 | | 175.0 |
| **18 Ga.** (.0478") | 2.00 | |
| 30x 96 | | 40.0 |
| 30x120 | | 50.0 |
| 36x 96 | | 48.0 |
| 36x120 | | 60.0 |
| 48x 96 | | 64.0 |
| 48x120 | | 80.0 |

## .40 TO .50 CARBON SHEETS

**High Quality—Hot Rolled—Open Hearth**

These sheared edge sheets have all the quality and uniformity of prime low carbon steel and offer greater hardness, strength, and resistance to abrasion due to higher carbon content. Heat treatment develops still greater hardness and strength. Used for: scrapers, blades, tools, and other applications requiring a strong, tough, moderate cost steel.

| U.S.S. or Mfrs. Ga. & Size, Inches | Wt. per Sq. Ft. | Est. Wt. per Sheet |
|---|---|---|
| **7 Ga.** (3/16") | 7.50 | |
| 48x192* | | 30.00 |
| 60x240* | | 37.50 |
| *Above weights are for one lineal foot of length.* | | |
| **10 Ga.** (.1345") | 5.625 | |
| 30x120 | | 140.6 |
| 30x144 | | 168.8 |
| 48x 96 | | 180.0 |
| 48x120 | | 225.0 |
| 48x192 | | 360.0 |
| 60x120 | | 281.3 |
| 60x144 | | 337.5 |
| **11 Ga.** (.1196") | 5.00 | |
| 48x120 Clev. | | 200.0 |
| **12 Ga.** (.1046") | 4.375 | |
| 30x 96 | | 87.5 |
| 30x120 | | 109.4 |
| 36x 96 | | 105.0 |
| 48x 96 | | 140.0 |
| 48x120 | | 175.0 |
| 60x 96 | | 175.0 |
| 60x120 | | 218.8 |
| 60x144 | | 262.5 |
| **14 Ga.** (.0747") | 3.125 | |
| 36x120 | | 93.8 |
| 48x120 | | 125.0 |
| **16 Ga.** (.0598") | 2.50 | |
| 36x120 | | 75.0 |
| 48x120 | | 100.0 |

* Stock sizes include 96, 120 and 144" lengths.

## PICKLED AND OILED SHEETS

**High Quality—Hot Rolled—Low Carbon—Open Hearth**

A mill edge sheet of uniform temper accurately rolled to a decimal thickness, and offering more versatility than hot rolled sheets because of the smooth, clean, scale free surface resulting from pickling. They are suitable for stamping and moderate drawing operations and readily weld and punch. Paint and enamel adhere well. Uses: automotive parts, household appliances, toys, etc.

| U.S.S. or Mfrs. Ga. & Size, Inches | Wt. per Sq. Ft. | Est. Wt. per Sheet |
|---|---|---|
| **7 Ga.**(.1793″) 7.50 | | |
| 36x120 | | 225.0 |
| 48x120 | | 300.0 |
| 48x144 | | 360.0 |
| **10 Ga.**(.1345″) 5.625 | | |
| 36x120 | | 168.8 |
| 48x120 | | 225.0 |
| 48x144 | | 270.0 |
| **11 Ga.**(.1196″) 5.00 | | |
| 36x 96 | | 120.0 |
| 36x120 | | 150.0 |
| 48x120 | | 200.0 |
| 60x144 | | 300.0 |
| **12 Ga.**(.1046″) 4.375 | | |
| 36x 96 | | 105.0 |
| 36x120 | | 131.3 |
| 48x 96 | | 140.0 |
| 48x120 | | 175.0 |
| **13 Ga.**(.0897″) 3.75 | | |
| 36x120 | | 112.5 |
| 48x120 | | 150.0 |
| **14 Ga.**(.0747″) 3.125 | | |
| 36x120 | | 93.8 |
| 48x120 | | 125.0 |
| 48x144 | | 150.0 |
| **16 Ga.**(.0598″) 2.50 | | |
| 30x 96 | | 50.0 |
| 36x 96 | | 60.0 |
| 36x120 | | 75.0 |
| 48x 96 | | 80.0 |
| 48x120 | | 100.0 |
| 48x144 | | 120.0 |
| **18 Ga.**(.0478″) 2.00 | | |
| 30x 96 | | 40.0 |
| 36x 96 | | 48.0 |
| 36x120 | | 60.0 |
| 48x120 | | 80.0 |

*Other size H.R. sheets can be pickled & oiled to order. See pages 44 and 45.*

**H.R. Pickled and Oiled Coils** in standard widths are regularly stocked. Intermediate widths are slit to your needs. See page 49.

## HI-STEEL® SHEETS

*High Strength—Low Alloy—Abrasion and Corrosion Resisting*

Identification Color: White

Hot Rolled • Conforms to SAE 950

A low alloy, high strength sheared edge sheet, resistant to abrasion and corrosion. Reasonably low cost permits use in place of other steel, reducing dead weight and extending life

| U.S.S. or Mfrs. Ga. & Size, Inches | Wt. per Sq. Ft. | Est. Wt. per Sheet |
|---|---|---|
| **7 Ga.**(3⁄16″) 7.50 | | |
| 48x192* | | 30.00 |
| 60x240* | | 37.50 |
| *Above wts. are for one lineal ft.* | | |
| **10 Ga.**(.1345″) 5.625 | | |
| 48x192 | | 360.0 |
| 60x120 | | 281.3 |
| **11 Ga.**(.1196″) 5.00 | | |
| 48x120 | | 200.0 |
| 48x192 | | 320.0 |
| **11 Ga.**(.1196″) 5.00 | | |
| 60x120 | | 250.0 |
| 60x192 | | 400.0 |
| **12 Ga.**(.1046″) 4.375 | | |
| 48x120 | | 175.0 |
| 48x192 | | 280.0 |
| **14 Ga.**(.0747″) 3.125 | | |
| 48x 96 | | 100.0 |
| 48x120 | | 125.0 |
| 48x192 | | 200.0 |

* Stock sizes include 96, 120 and 144″ lengths.

## COLD ROLLED SHEETS

**High Quality—Soft—Open Hearth**

A continuous mill product made with a high degree of gauge accuracy and uniformity of physical characteristics on the most modern rolling equipment. The smooth de-oxidized satin finish gives an excellent base for paint, lacquer and enamel. Box annealing and absence of scale permit stamping and moderate drawing operations in the production of a wide variety of formed products. Sheets bend flat on themselves, any direction, without cracking. Oiling protects the smooth, satiny surface against rust while in stock. Among the many uses are refrigerators, ranges, washing machines, truck bodies, signs, panels, lockers, store fixtures, etc.

*For Hot Rolled Sheets see pages 44 thru 45.*

| U.S.S. or Mfrs. Ga. & Size, Inches | Wt. per Sq. Ft. | Est. Wt. per Sheet |
|---|---|---|
| **10 Ga.**(.1345″) 5.625 | | |
| 36x 96 | Chgo. | 135.0 |
| 48x120 | Chgo. | 225.0 |
| **11 Ga.**(.1196″) 5.00 | | |
| 36x 96 | | 120.0 |
| 36x120 | | 150.0 |
| 48x120 | | 200.0 |
| 60x120 | Buff. | 250.0 |
| **12 Ga.**(.1046″) 4.375 | | |
| 36x 96 | | 105.0 |
| 36x120 | Det. | 131:3 |
| 48x 96 | Cinc. | 140.0 |
| 48x120 | | 175.0 |
| 60x120 | Buff. | 218.8 |
| **13 Ga.**(.0897″) 3.75 | | |
| 36x120 | | 112.5 |
| 48x120 | | 150.0 |
| 60x120 | Buff. | 187.5 |
| **14 Ga.**(.0747″) 3.125 | | |
| 30x 96 | | 62.5 |
| 36x 96 | | 75.0 |
| 36x120 | | 93.8 |
| 48x 96 | Buff. | 100.0 |
| 48x120 | | 125.0 |
| 48x144 | | 150.0 |
| 60x120 | Clev. | 156.3 |
| **15 Ga.**(.0673″) 2.812 | | |
| 36x 96 | | 67.5 |
| **16 Ga.**(.0598″) 2.50 | | |
| 30x 96 | | 50.0 |
| 36x 96 | | 60.0 |
| 36x120 | | 75.0 |
| 36x144 | Det. | 90.0 |
| 48x 96 | | 80.0 |
| 48x120 | | 100.0 |
| 48x144 | | 120.0 |
| 60x120 | Clev. | 125.0 |
| **17 Ga.**(.0538″) 2.25 | | |
| 30x 96 | | 45.0 |
| **18 Ga.**(.0478″) 2.00 | | |
| 30x 96 | | 40.0 |
| 36x 96 | | 48.0 |
| 36x120 | | 60.0 |

| U.S.S. or Mfrs. Ga. & Size, Inches | Wt. per Sq. Ft. | Est. Wt. per Sheet |
|---|---|---|
| **18 Ga.**(.0478″) 2.00 | | |
| 48x 96 | Det. | 64.0 |
| 48x120 | | 80.0 |
| 48x144 | Clev. | 96.0 |
| 60x120 | Clev. | 100.0 |
| **19 Ga.**(.0418″) 1.75 | | |
| 36x120 | | 52.5 |
| 48x120 | | 70.0 |
| **20 Ga.**(.0359″) 1.50 | | |
| 30x 96 | | 30.0 |
| 36x 96 | | 36.0 |
| 36x120 | | 45.0 |
| 36x144 | | 54.0 |
| 42x144 | | 63.0 |
| 48x 96 | | 48.0 |
| 48x120 | | 60.0 |
| 48x144 | | 72.0 |
| 60x120 | Clev. | 75.0 |
| **22 Ga.**(.0299″) 1.25 | | |
| 30x 96 | | 25.0 |
| 36x 96 | | 30.0 |
| 36x120 | | 37.5 |
| 48x 96 | | 40.0 |
| 48x120 | | 50.0 |
| 60x120 | Clev. | 62.5 |
| **24 Ga.**(.0239″) 1.00 | | |
| 30x 96 | | 20.0 |
| 30x120 | Buff. | 25.0 |
| 36x 96 | | 24.0 |
| 36x120 | | 30.0 |
| 48x 96 | | 32.0 |
| 48x120 | | 40.0 |
| **26 Ga.**(.0179″) .75 | | |
| 30x 96 | | 15.0 |
| 36x 96 | St.L. | 18.0 |
| 36x120 | | 22.5 |
| **28 Ga.**(.0149″) .625 | | |
| 30x 96 | | 12.5 |
| 36x 96 | Det. | 15.0 |
| **30 Ga.**(.0120″) .50 | | |
| 36x 96 | Buff. | 12.0 |
| 36x120 | Buff. | 15.0 |

**Cold Rolled Sheet and Strip Coils** in standard widths are regularly available from stock—intermediate widths can also be slit to meet your requirements. See page 49.

## COLD ROLLED SHEETS — STRETCHER LEVELED

**High Quality—Oiled**

A uniform high quality satin finish sheet that has been further processed by stretcher leveling to meet the exacting requirements of certain industries. Produced especially for the manufacture of fine metal furniture, table tops, truck body panels, partitions and other products requiring perfectly flat material. Furnished resquared or not resquared.

| U.S.S. or Mfrs. Ga. & Size, Inches | Wt. per Sq. Ft. | Est. Wt. per Sheet |
|---|---|---|
| **10 Ga.** (.1345″) 5.625 | | |
| 36x 96 | | 135.0 |
| 48x120 | | 225.0 |
| **11 Ga.** (.1196″) 5.00 | | |
| 36x 96 | | 120.0 |
| 36x120 | | 150.0 |
| 48x120 | | 200.0 |
| 60x144 Det. | | 300.0 |
| **12 Ga.** (.1046″) 4.375 | | |
| 36x 96 | | 105.0 |
| 48x120 | | 175.0 |
| **14 Ga.** (.0747″) 3.125 | | |
| 36x 96 | | 75.0 |
| 36x120 | | 93.8 |
| 48x120 | | 125.0 |
| 48x144 | | 150.0 |
| 60x120 | | 156.3 |
| 72x144 | | 225.0 |
| **16 Ga.** (.0598″) 2.50 | | |
| 36x 96 Det. | | 60.0 |
| 48x120 | | 100.0 |
| 48x144 | | 120.0 |
| 54x120 | | 112.5 |
| 60x144 | | 150.0 |
| 72x120 | | 150.0 |
| 72x144 | | 180.0 |
| **18 Ga.** (.0478″) 2.00 | | |
| 30x 96 | | 40.0 |
| 36x 96 | | 48.0 |
| 42x144 | | 84.0 |
| 48x120 | | 80.0 |
| **18 Ga.** (.0478″) 2.00 | | |
| 48x144 | | 96.0 |
| 54x156 | | 117.0 |
| 60x144 | | 120.0 |
| **20 Ga.** (.0359″) 1.50 | | |
| 30x 96 Det. | | 30.0 |
| 30x120 Det. | | 37.5 |
| 36x 96 Det. | | 36.0 |
| 36x144 | | 54.0 |
| 36x156 Buff. | | 58.5 |
| 42x 96 Det. | | 42.0 |
| 42x120 Det. | | 52.5 |
| 42x144 | | 63.0 |
| 48x 96 | | 48.0 |
| 48x120 | | 60.0 |
| 48x144 | | 72.0 |
| 48x156 | | 78.0 |
| 60x156 | | 97.5 |
| **22 Ga.** (.0299″) 1.25 | | |
| 30x 96 | | 25.0 |
| 36x 96 Det. | | 30.0 |
| 42x144 | | 52.5 |
| 48x 96 | | 40.0 |
| 48x120 | | 50.0 |
| 48x144 | | 60.0 |
| 60x120 Clev. | | 62.5 |
| **24 Ga.**(.0239″) 1.00 | | |
| 36x120 Buff. | | 30.0 |
| **26 Ga.** (.0179″) .75 | | |
| 42x144 | | 31.5 |

## COLD ROLLED SHEETS — LUSTRE FINISH

This coil stock is produced to Ryerson specifications with a special finish which is much more lustrous than that of a standard cold-rolled sheet. Many have found this finish suitable for chrome plating after a minimum amount of preparation. Flat sheets, sheared strip, or slit coils are furnished to your exact requirements on a prompt delivery basis. Typical applications: Furniture tubing, automobile accessories, etc.

## COLD ROLLED SHEETS — DRAWING QUALITY

For severe drawing or forming operations, sheets with extra low carbon and maximum uniformity will be selected to meet your end use.

# SHEET COILS

## LOW CARBON — HIGH QUALITY

In Stock Widths or Slit with No. 3 Slit Edge

Listed below are the many different types and sizes of sheet coil regularly carried in our stock. Whether used directly on your production equipment—or processed first into smaller coils or flat sheets on our slitters and cut-to-length lines—they are the choice of many buyers who purchase sheet steel in economical production quantities.

Standard mill width tolerances will apply. Special tempers, qualities or specifications can be furnished to meet your requirements.

### HOT ROLLED — Commercial Finish

| Thickness in Inches | Est. Wt. per Sq. Ft. in Lbs. | Max. Width in Inches | Thickness in Inches | Est. Wt. per Sq. Ft. in Lbs. | Max. Width in Inches |
|---|---|---|---|---|---|
| .1875 | 7.841 | 48 | .1046 | 4.375 | 48 |
| .1345 | 5.625 | 48 | .083 | 3.471 | 48 |
| .134 | 5.604 | 48 | .0747 | 3.125 | 48 |
| .125 | 5.228 | 48 | .065 | 2.718 | 48 |
| .1196 | 5.000 | 48 | .0598 | 2.500 | 48 |
| .109 | 4.558 | 48 | .0478 | 2.000 | 36 |

### H.R. PICKLED & OILED — Commercial Finish

| | | | | | |
|---|---|---|---|---|---|
| .1345 | 5.625 | 48 | .095 | 3.973 | 48 |
| .125 | 5.228 | 48 | .083 | 3.471 | 48 |
| .1196 | 5.000 | 48 | .0747 | 3.125 | 48 |
| .109 | 4.558 | 48 | .072 | 3.011 | 48 |
| .1046 | 4.375 | 48 | .0625 | 2.614 | 48 |
| | | | .0598 | 2.500 | 48 |

### COLD ROLLED — Commercial Finish

Soft Temper, Rockwell B 60 Max.

| | | | | | |
|---|---|---|---|---|---|
| .018 | .7523 | 48 | .049 | 2.049 | 48 |
| .020 | .8364 | 48 | .0598 | 2.501 | 48 |
| .0239 | .995 | 48 | .0625 | 2.614 | 48 |
| .0299 | 1.250 | 48 | .068 | 2.844 | 48 |
| .032 | 1.338 | 48 | .0747 | 3.124 | 48 |
| .0359 | 1.501 | 48 | .083 | 3.471 | 48 |
| .042 | 1.756 | 48 | .095 | 3.973 | 48 |
| .0478 | 1.999 | 48 | | | |

### COLD ROLLED — Bright Finish

Soft Temper, Rockwell B 60 Approx.

| | | | | | |
|---|---|---|---|---|---|
| .018 | .7523 | 48 | .0478 | 1.999 | 48 |
| .0239 | .995 | 48 | .049 | 2.049 | 48 |
| .025 | 1.046 | 48 | .0598 | 2.501 | 48 |
| .0299 | 1.250 | 48 | .0625 | 2.614 | 48 |
| .0359 | 1.501 | 48 | | | |

### GALVANIZED

| | | | | | |
|---|---|---|---|---|---|
| 16 Ga. | 2.656 | 48 | 22 Ga. | 1.406 | 48 |
| 18 Ga | 2.156 | 48 | 24 Ga. | 1.156 | 48 |
| 20 Ga. | 1.656 | 48 | 26 Ga. | .906 | 48 |

### Tempers — Strip Steel

| Temper No. | Description | Rockwell Range |
|---|---|---|
| 1 | Hard: .070″ and heavier | B84 minimum |
| | .069″ and lighter | B90 minimum |
| 2 | Half Hard | B70 to B85 |
| 3 | Quarter Hard | B60 to B75 |
| 4 | Soft | B65 maximum |
| 5 | Dead Soft | B55 maximum |

## GALVANIZED STEEL SHEETS—TICO QUALITY

ASTM Spec. A-93 Latest

**Tico Quality** sheets are continuously annealed and galvanized by a special, carefully controlled process which results in an exceptionally tight coat of spelter. Sheets can be severely formed without flaking or peeling. Stamping, cold-drawing, double-seaming and brake or roll-forming will not impair the protective qualities of these sheets. Can be welded and soldered.

*Sheets 20 Ga. and lighter are Lockforming Quality*

| Galv. Sheet Ga. & Size in Inches | Est. Wt. per Sheet in Lbs. |
|---|---|
| **10 Ga.** 5.781 Lbs. Sq. Ft. | |
| 36x 96 | 138.8 |
| 36x120 | 173.4 |
| 48x 96 | 185.0 |
| 48x120 | 231.2 |
| 60x120 Cinc. | 289.0 |
| **12 Ga.** 4.531 Lbs. Sq. Ft. | |
| 36x 96 | 108.8 |
| 36x120 | 135.9 |
| 48x 96 | 145.0 |
| 48x120 | 181.2 |
| **14 Ga.** 3.281 Lbs. Sq. Ft. | |
| 30x120 | 82.0 |
| 36x 96 | 78.8 |
| 36x120 | 98.4 |
| 48x 96 | 105.0 |
| 48x120 | 131.2 |
| **16 Ga.** 2.656 Lbs. Sq. Ft. | |
| 28x 96 | 49.6 |
| 28x120 | 62.0 |
| 30x 96 | 53.1 |
| 30x120 | 66.4 |
| 36x 96 | 63.8 |
| 36x120 | 79.7 |
| 48x 96 | 85.0 |
| 48x120 | 106.2 |
| **18 Ga.** 2.156 Lbs. Sq. Ft. | |
| 28x 96 | 40.2 |
| 28x120 | 50.3 |
| 28x144 | 60.4 |
| 30x 96 | 43.1 |
| 30x120 | 53.9 |
| 36x 96 | 51.8 |
| 36x120 | 64.7 |
| 48x 96 | 69.0 |
| 48x120 | 86.2 |
| **20 Ga.** 1.656 Lbs. Sq. Ft. | |
| 28x 96 | 30.9 |
| 28x120 | 38.6 |
| 28x144 | 46.4 |
| 30x 96 | 33.1 |
| 30x120 | 41.4 |
| 36x 96 | 39.8 |
| 36x120 | 49.7 |
| 48x 96 | 53.0 |
| 48x120 | 66.2 |
| **22 Ga.** 1.406 Lbs. Sq. Ft. | |
| 28x 96 | 26.2 |
| 28x108 | 29.5 |
| 28x120 | 32.8 |
| 28x144 | 39.4 |

| Galv. Sheet Ga. & Size in Inches | Est. Wt. per Sheet in Lbs. |
|---|---|
| **22 Ga.** 1.406 Lbs. Sq. Ft. | |
| 30x 96 | 28.1 |
| 30x120 | 35.2 |
| 36x 96 | 33.8 |
| 36x120 | 42.2 |
| 48x 96 | 45.0 |
| 48x120 | 56.2 |
| **24 Ga.** 1.156 Lbs. Sq. Ft. | |
| 28x 96 | 21.6 |
| 28x108 | 24.3 |
| 28x120 | 27.0 |
| 28x144 | 32.4 |
| 30x 96 | 23.1 |
| 30x120 | 28.9 |
| 36x 96 | 27.8 |
| 36x120 | 34.7 |
| 48x 96 | 37.0 |
| 48x120 | 46.2 |
| **26 Ga.** .906 Lbs. Sq. Ft. | |
| 28x 84 | 14.8 |
| 28x 96 | 16.9 |
| 28x108 | 19.0 |
| 28x120 | 21.1 |
| 28x144 | 25.4 |
| 30x 96 | 18.1 |
| 30x120 | 22.7 |
| 30x144 | 27.2 |
| 32x 96 | 18.1 |
| 32x120 | 24.2 |
| 36x 96 | 21.8 |
| 36x120 | 27.2 |
| 48x 96 | 29.0 |
| 48x120 | 36.2 |
| **28 Ga.** .781 Lbs. Sq. Ft. | |
| 28x 84 | 12.8 |
| 28x 96 | 14.6 |
| 28x120 | 18.2 |
| 28x144 | 21.8 |
| 30x 96 | 15.6 |
| 30x120 | 19.5 |
| 30x144 | 23.4 |
| 32x 96 | 16.6 |
| 32x120 | 20.8 |
| 36x 96 | 18.8 |
| 36x120 | 23.4 |
| **30 Ga.** .656 Lbs. Sq. Ft. | |
| 30x 96 | 13.1 |
| 30x120 | 16.4 |
| 36x 96 | 15.8 |
| 36x120 | 19.7 |

No scrap allowance when cut to size. Waste kept unless told otherwise.

## GALVANNEALED STEEL SHEETS

*Painting and Lacquering Quality*
ASTM Spec. A-93 latest

Coated with a non-flaking zinc by a special process which makes the zinc a definite part of the sheet and eliminates flaking or peeling when sheets are formed or fabricated. Difficult forming operations which cause galvanized sheets to flake prompted the development of galvannealed sheets.

May be formed with dies or handled in brakes without injury to the coating. Paint or lacquer readily adhere to these sheets and may be applied immediately—no waiting for sheets to "weather." Can be soldered or spot welded. Withstands temperatures up to about 750° F. without flaking. Ordinary galvanized coatings in such service tend to flake seriously. At least 1.25 ounces of coating per sq. ft.

Particularly suited for difficult forming, bending and fabricating work, sign boards and formed products such as mouldings, corner beads, sash, columns, etc.

*Sheets 20 Ga. and lighter are Lockforming Quality*

| Galv. Sheet Ga. & Size in Inches | Est. Wt. per Sheet in Lbs. |
|---|---|
| **14 Ga.** 3.281 Lbs. Sq. Ft. | |
| 36x120 | 98.4 |
| 48x120 | 131.2 |
| **16 Ga.** 2.656 Lbs. Sq. Ft. | |
| 36x 96 | 63.8 |
| 36x120 | 79.7 |
| 48x 96 | 85.0 |
| 48x120 | 106.2 |
| **18 Ga.** 2.156 Lbs. Sq. Ft. | |
| 36x 96 | 51.8 |
| 36x120 | 64.7 |
| 48x 96* | 69.0 |
| 48x120* | 86.2 |
| 48x144* | 103.5 |
| **20 Ga.** 1.656 Lbs. Sq. Ft. | |
| 30x 96 | 33.1 |
| 30x120 | 41.4 |
| 36x 96 | 39.8 |
| 36x120 | 49.7 |
| 42x144* | 69.6 |
| 48x 96* | 53.0 |
| 48x120* | 66.2 |
| 48x144* | 79.5 |
| **22 Ga.** 1.406 Lbs. Sq. Ft. | |
| 36x 96 | 33.8 |
| 36x120 | 42.2 |
| 42x144* | 59.1 |
| 48x 96* | 45.0 |
| **22 Ga.** 1.406 Lbs. Sq. Ft. | |
| 48x120* | 56.2 |
| 48x144* | 67.5 |
| **24 Ga.** 1.156 Lbs. Sq. Ft. | |
| 30x 96 | 23.1 |
| 30x120 | 28.9 |
| 36x 96 | 27.8 |
| 36x120 | 34.7 |
| 42x120 | 40.5 |
| 48x 96 | 37.0 |
| 48x120 | 46.2 |
| **26 Ga.** .906 Lbs. Sq. Ft. | |
| 30x 96 | 18.1 |
| 30x120 | 22.7 |
| 36x 96 | 21.8 |
| 36x120 | 27.2 |
| 36x144 | 32.6 |
| 42x 96 | 25.4 |
| 42x120 | 31.7 |
| 42x144 | 38.1 |
| 48x 96 | 28.9 |
| 48x120 | 36.2 |
| **28 Ga.** .781 Lbs. Sq. Ft. | |
| 30x 96 | 15.6 |
| 30x120 | 19.5 |
| 36x 96 | 18.8 |
| 36x120 | 23.4 |

* Stretcher leveled but not resquared.

**Galvanized Coils** in standard widths are regularly available from stock. Intermediate widths can also be slit to meet your requirements. See page 49.

**ABRASION RESISTING SHEETS** (*See page 36.*)

## VITREOUS ENAMELING IRON SHEETS

**Soft Quality**

In both chemical analysis and method of processing, these sheets are produced especially for the manufacture of porcelain enameled products. Cold rolled from commercially pure iron ingots, the final processing imparts a type of textured surface free from foreign particles that offers a good grip to the enamel, resulting in tight adherence of the coating. Sheets in stock are suitable for forming and moderate drawing operations, and all flatwork requirements.

Uses: Washing machines, refrigerators, table tops, stove panels, signs, & equipment for hospitals, dairies, barber shops, etc.

| U.S.S. or Mfrs. Gauge and Size in Inches | Wt. per Sq. Ft. | Est. Wt. per Sheet |
|---|---|---|
| **16 Ga.**(.0598″) | 2.50 | |
| 36x120 | | 75.0 |
| 48x120 Det. | | 100.0 |
| **18 Ga.**(.0478″) | 2.00 | |
| 30x 96 | | 40.0 |
| 30x120 | | 50.0 |
| 36x 96 | | 48.0 |
| 36x120 | | 60.0 |
| 48x120 | | 80.0 |
| **20 Ga.**(.0359″) | 1.50 | |
| 30x 96 | | 30.0 |
| **20 Ga.**(.0359″) | 1.50 | |
| 30x120 | | 37.5 |
| 36x 96 | | 36.0 |
| 36x120 | | 45.0 |
| 42x120 | | 52.5 |
| 48x120 | | 60.0 |
| **22 Ga.**(.0299″) | 1.25 | |
| 30x 96 | | 25.0 |
| 36x120 | | 37.5 |
| **24 Ga.**(.0239″) | 1.00 | |
| 36x120 | | 30.0 |

## LONG TERNE SHEETS

**Standard Coat**

**Nominal Coating Weight, 6 Lbs. Per Double Base Box**

A uniform quality soft steel sheet coated by immersion in a bath of terne metal, an alloy of lead and tin. All sheets are primes and have an oiled finish. Can take moderate stamping and forming operations without surface flaking. Particularly adapted to soldering due to the naturally close union of terne metal and solder.

Used for soldered tanks, automobile accessories, hood and radiator work, fireproof window work and many other stamped and formed products.

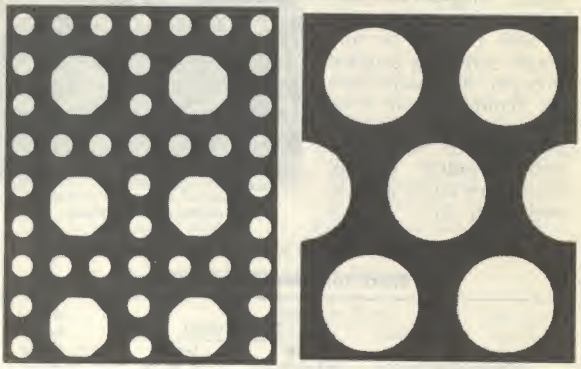
| Long Terne Gauge and Size in Inches | Wt. per Sq. Ft. | Est. Wt. per Sheet |
|---|---|---|
| **16 Ga.**(.0598″) | 2.516 | |
| 36x120 | | 75.48 |
| **18 Ga.**(.0478″) | 2.016 | |
| 36x120 | | 60.48 |
| **20 Ga.**(.0359″) | 1.516 | |
| 36x120 | | 45.48 |
| **22 Ga.**(.0299″) | 1.266 | |
| 36x120 | | 37.98 |
| **24 Ga.**(.0239″) | 1.016 | |
| 36x120 | | 30.48 |
| **26 Ga.**(.0179″) | .0766 | |
| 36x120 | | 22.98 |

No scrap allowance on Long Terne Sheets cut to special sizes. Waste retained unless advised to the contrary.

## PERFORATED SHEETS AND PLATES

Perforated sheets and plates are widely used for belt and machine guards, ventilators, screens and strainers, filters, trays and cabinets, grilles—and a variety of ornamental purposes. Ryerson stocks for immediate shipment standard cane and machine guard sheets, and perforates to order an infinite variety of patterns and sizes from our large stocks of carbon and stainless steel sheets and plates.

### IN STOCK: Cold Rolled Carbon Steel



**Standard Cane**
(36%) Open Area

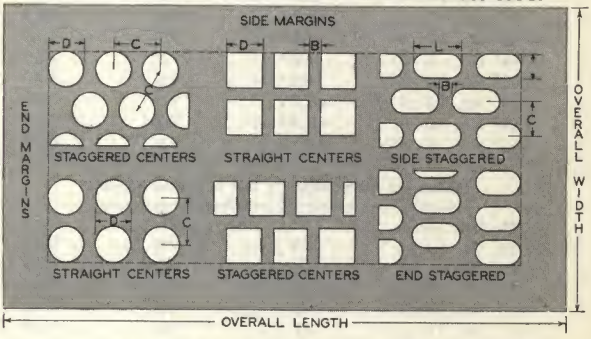
**Machine Guard**
(47%) Open Area

*(Actual Size of Perforations)*

Stock Size: 22 Gage x 36″ x 120″

Stock Sizes: 20 Gage x 36″ x 96″ 20 Gage x 36″ x 120″

### PERFORATED TO ORDER: Carbon and Stainless Steel




**Typical layout—Standard patterns**

D—DIAMETER OR SIDE OF HOLE.
C—CENTER DISTANCE
L—LENGTH OF SLOT.
B—BAR DISTANCE.

When specifying sheets and plates perforated to your order, please refer to layout and give us the following information:

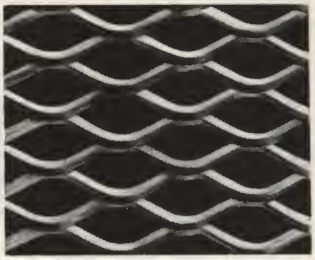
1. Number of pieces.
2. Gauge or thickness in inches.
3. Kind of steel—carbon, stainless, etc.
4. Overall width and length.
5. Size and shape of holes; indicate percentage of open area desired.
6. Type of centers—straight or staggered.
7. Indicate hole spacing (B,C.).
8. Side and end margins in inches, if required.
9. If holes are slotted, state if slot is parallel to the length or to the width of the sheet.
10. If sheets are used for screening, indicate direction of flow—from side to side or end to end.

## RYEX® EXPANDED METAL — STANDARD

**Carbon or Stainless Steel**

*For Ryex Expanded Metal Grating, see page 25*

Ryex is expanded from a solid sheet of steel and is more rigid than an equal weight of solid steel plate or wire mesh. It can be cut to any shape, retaining original strength. All sharp edges are removed from both Standard and Flattened Mesh. Used for partitions, window guards, machinery safety guards, enclosures, etc.



Long way of diamond runs parallel to the length of sheet.

*Ask for folder showing uses and engineering data*

**In Stock for Immediate Shipment**

| Style Designation* | Size of Sheet Width in Inches | Size of Sheet Length in Inches | Wt. per Sq. Ft. (Plain) in Lbs. |
|---|---|---|---|
| ¼" No. 20 | 36,48 | 96 | 0.86 |
| ½" No. 20 | 48 | 96 | 0.43 |
| ½" No. 18 | 48,72 | 96 | 0.70 |
| ½" No. 16 | 48 | 96 | 0.86 |
| ½" No. 13 | 48,72 | 96 | 1.47 |
| ¾" No. 16 | 72 | 96 | 0.54 |
| ¾" No. 13 | 48,72 | 96 | 0.80 |
| ¾" No. 10 | 48 | 96 | 1.20 |
| ¾" No. 9 | 48 | 96 | 1.80 |
| 1½" No. 16 | 48 | 96 | 0.40 |
| 1½" No. 13 | 48,72 | 96 | 0.60 |
| 1½" No. 10 | 48,72 | 96 | 0.79 |
| 1½" No. 9 | 48,72 | 96 | 1.20 |

**Shipped from Mill** (*5 Ton Minimum Order*)

| | | | |
|---|---|---|---|
| ⅝" No. 16 | 48 | 96 | 0.73 |
| ⅝" No. 13 | 48 | 96 | 1.19 |
| ⅝" No. 10 | 48 | 96 | 1.59 |
| ⅝" No. 9 | 48 | 96 | 2.41 |
| 1" No. 16 | 48 | 96 | 0.44 |
| 1" No. 13 | 48 | 96 | 0.67 |
| 1" No. 10 | 48 | 96 | 0.96 |
| 1" No. 9 | 48 | 96 | 1.44 |

*STYLE DESIGNATION: First number represents nominal width of diamond in inches. Second number represents approximate gauge of plate before expanding except that No. 10 is expanded from approximately 13 Ga.

**Special Sheet Sizes:** Stock size sheets can be sheared to your required size. Charge is based on total area of stock size sheets needed to fill the order, plus $10.00 per 100 pieces cut. Minimum charge is $2.00. Special sheet sizes can be furnished on a net area basis from the mill on a minimum order of 5 tons per size.

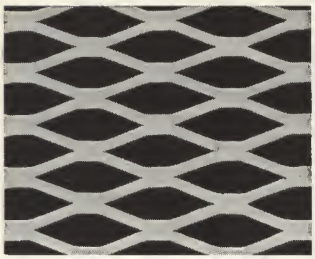
**Special Designs and Finishes:** Small mesh and decorative designs are available. Information will be gladly furnished. Galvanized, tinned or cadmium plated finishes can be supplied. Standard mesh has an oil finish.

*For approximate dimensions, see page 56*

## RYEX EXPANDED METAL — FLATTENED

**Carbon or Stainless Steel**

*For Ryex Expanded Metal Grating, see page 25*



Long way of diamond runs parallel to the length of sheet.

Ryex Flattened Expanded Metal is furnished in flat sheets with smooth surfaces. It is sanitary and easy to keep clean and can be painted, tinned or galvanized. Design is attractive, cost is low. Used with various edgings, it easily fabricates into ventilator guards, grilles, shelves, trays, bins, racks and other items.

**In Stock for Immediate Shipment**

| Style Designation* | Standard Sheet Width in Inches | Standard Sheet Length in Inches | Wt. per Sq. Ft. (Plain) in Lbs. |
|---|---|---|---|
| ¼″ No. 20-22 | 36,48 | 96 | 0.83 |
| ¼″ No. 18-20 | 48 | 96 | 1.11 |
| ½″ No. 20-22 | 36,48 | 96 | 0.40 |
| ½″ No. 18-20 | 36,48 | 96 | 0.66 |
| ½″ No. 16-18 | 36,48 | 96 | 0.82 |
| ½″ No. 13-15 | 36,48 | 96 | 1.40 |
| ¾″ No. 16-18 | 36,48 | 96 | 0.51 |
| ¾″ No. 14-16 | 36,48 | 96 | 0.63 |
| ¾″ No. 13-15 | 36,48 | 96 | 0.75 |
| ¾″ No. 9-11 | 36,48 | 96 | 1.71 |
| 1½″ No. 16-18 | 36,48 | 96 | 0.38 |
| 1½″ No. 14-16 | 36,48 | 96 | 0.46 |
| 1½″ No. 13-15 | 36 | 96 | 0.57 |
| 1½″ No. 9-11 | 36,48 | 96 | 1.14 |

**Shipped from Mill** (*5 Ton Minimum Order*)

| | | | |
|---|---|---|---|
| ⅝″ No. 16-18 | 36 & 48 | 96 | 0.69 |
| ⅝″ No. 14-16 | 36 & 48 | 96 | 0.93 |
| ⅝″ No. 9-11 | 36 & 48 | 96 | 2.26 |
| 1″ No. 16-18 | 36 & 48 | 96 | 0.41 |
| 1″ No. 14-16 | 36 & 48 | 96 | 0.55 |

* STYLE DESIGNATION: First number represents nominal width of diamond in inches. Second number represents approximate gauge of plate before expanding. Third number represents approximate gauge after flattening.

**Special Sheet Sizes:** Stock size sheets can be sheared to your required size. Charge is based on total area of stock size sheets needed to fill the order, plus $10.00 per 100 pieces cut. Minimum charge is $2.00. Special sheet sizes can be furnished on a net area basis from the mill on a minimum order of 5 tons per size.

**Special Designs and Finishes:** Small mesh and decorative designs are available. Information will be gladly furnished. Galvanized, tinned or cadmium plated finishes can be supplied. Stock mesh has an oil finish.

*For approximate dimensions, see page 56.*

# DIMENSIONS FOR RYEX EXPANDED METAL

## STANDARD

Sizes, Approximate Dimensions, Gauges and Weights

| Style Designation | Weight in Lbs. per Square Ft. | | Approx. Strand Size, Inches | | Size of Openings in Inches | | Cent. to Cent. of Bridges in Inches | |
|---|---|---|---|---|---|---|---|---|
| | Plain | Galv. | Thick | Width | Width | Lgth. | Width | Lgth. |
| ½" No. 18 | .70 | .85 | .048 | .088 | 7/16 | 15/16 | .50 | 1.2 |
| ½" No. 16 | .86 | .97 | .060 | .087 | 3/8 | 15/16 | .50 | 1.2 |
| ½" No. 13 | 1.47 | 1.73 | .092 | .096 | 5/16 | 15/16 | .50 | 1.2 |
| 5/8" No. 16 | .73 | .86 | .060 | .093 | ½ | 1 3/8 | .631 | 1.7 |
| 5/8" No. 13 | 1.19 | 1.37 | .092 | .098 | 7/16 | 1 3/8 | .631 | 1.7 |
| 5/8" No. 10 | 1.59 | 1.80 | .092 | .131 | 7/16 | 1 5/16 | .631 | 1.7 |
| 5/8" No. 9 | 2.41 | 2.64 | .134 | .153 | 7/16 | 1 1/4 | .706 | 1.7 |
| ¾" No. 16 | .54 | .65 | .060 | .101 | 13/16 | 1 3/4 | .923 | 2.0 |
| ¾" No. 13 | .80 | .92 | .092 | .096 | ¾ | 1 11/16 | .923 | 2.0 |
| ¾" No. 10 | 1.20 | 1.36 | .092 | .144 | ¾ | 1 5/8 | .923 | 2.0 |
| ¾" No. 9 | 1.80 | 1.95 | .134 | .150 | 11/16 | 1 5/16 | .923 | 2.0 |
| 1" No. 16 | .44 | .51 | .060 | .097 | 1 | 2 1/16 | 1.09 | 2.4 |
| 1" No. 13 | .67 | .77 | .092 | .096 | 15/16 | 2 | 1.09 | 2.4 |
| 1" No. 10 | .96 | 1.06 | .092 | .136 | 7/8 | 2 | 1.09 | 2.4 |
| 1" No. 9 | 1.44 | 1.55 | 1.34 | .141 | 7/8 | 1 15/16 | 1.09 | 2.4 |
| 1½" No. 13 | .60 | .68 | .092 | .105 | 1 3/16 | 2½ | 1.33 | 3.0 |
| 1½" No. 10 | .79 | .89 | .092 | .138 | 1 3/16 | 2½ | 1.33 | 3.0 |
| 1½" No. 9 | 1.20 | 1.31 | .134 | .144 | 1 1/8 | 2 3/8 | 1.33 | 3.0 |

## FLATTENED

Sizes, Approximate Dimensions, Gauges and Weights

| Style Designation | Weight in Lbs. per Square Ft. | | Approx. Finished Thickness in Inches | Size of Openings in Inches | | Cent. to Cent. of Bridges in Inches | |
|---|---|---|---|---|---|---|---|
| | Plain | Galv. | | Width | Lgth. | Width | Lgth. |
| ½" No. 20-22 | .40 | .51 | .029 | 3/8 | 1 | .50 | 1.26 |
| ½" No. 18-20 | .66 | .88 | .039 | 9/32 | 1 | .50 | 1.26 |
| ½" No. 16-18 | .82 | 1.00 | .050 | ¼ | 1 | .50 | 1.26 |
| ½" No. 13-15 | 1.40 | 1.62 | .070 | ¼ | 1 | .50 | 1.26 |
| 5/8" No. 16-18 | .69 | .80 | .048 | 7/16 | 1½ | .631 | 1.82 |
| 5/8" No. 14-16 | .93 | 1.08 | .060 | 7/16 | 1½ | .631 | 1.82 |
| 5/8" No. 9-11 | 2.26 | 2.44 | .120 | 3/8 | 1½ | .705 | 1.82 |
| ¾" No. 16-18 | .51 | .71 | .048 | ¾ | 1 3/4 | .923 | 2.10 |
| ¾" No. 14-16 | .63 | .79 | .061 | 11/16 | 1 25/32 | .923 | 2.12 |
| ¾" No. 13-15 | .75 | .86 | .070 | 11/16 | 1 25/32 | .923 | 2.10 |
| ¾" No. 9-11 | 1.71 | 1.86 | .120 | 9/16 | 1 11/16 | .923 | 2.12 |
| 1" No. 16-18 | .41 | .50 | .048 | 7/8 | 2 1/4 | 1.09 | 2.56 |
| 1" No. 14-16 | .55 | .65 | .060 | 7/8 | 2 1/4 | 1.09 | 2.56 |
| 1½" No. 16-18 | .38 | .44 | .048 | 1 1/16 | 2 3/4 | 1.33 | 3.20 |
| 1½" No. 14-16 | .46 | .56 | .060 | 1 1/16 | 2 3/4 | 1.33 | 3.20 |
| 1½" No. 9-11 | 1.14 | 1.28 | .110 | 1 | 2 9/16 | 1.33 | 3.20 |

## CORRUGATED STEEL SHEETS

**Galvanized or Uncoated**

2½" or 1¼" Corrugation

Our corrugating machine handles all types of sheets, including stainless, in special widths up to 36 inches and lengths up to 12 feet. All sheets can be furnished with standard 2½" corrugations. Sheets 18 Ga. and lighter can also be furnished with 1¼" corrugations.

*Weights are for stock sizes with 2½" corrugation.*

| Galvanized and U.S.S. Gauge (Revised) Sizes in Inches | Weight per Sheet | | *No. Sheets per Square (100 Sq. Ft.) | *Wt. per Sq. | |
|---|---|---|---|---|---|
| | Galv. | Uncoated | | Galv. | Uncoated |
| **No. 16**x26x 96 | 49.567 | 46.620 | 5.769 | 286 | 270 |
| 26x120 | 62.938 | 58.225 | 4.615 | 286 | 270 |
| **No. 18**x26x 72 | 30.161 | ..... | 7.692 | 232 | ..... |
| 26x 84 | 35.189 | ... | 6.593 | 232 | ... |
| 26x 96 | 40.208 | 37.262 | 5.769 | 232 | 216 |
| 26x108 | 45.224 | 41.910 | 5.128 | 232 | 216 |
| 26x120 | 50.325 | 46.537 | 4.615 | 232 | 216 |
| 26x144 | 60.322 | 56.162 | 3.846 | 232 | 216 |
| **No. 20**x26x 72 | 23.147 | 21.066 | 7.692 | 178 | 163 |
| 26x 84 | 27.011 | 24.589 | 6.593 | 178 | 163 |
| 26x 96 | 30.850 | 28.076 | 5.769 | 178 | 163 |
| 26x108 | 34.698 | 31.579 | 5.128 | 178 | 163 |
| 26x120 | 38.612 | 35.065 | 4.615 | 178 | 163 |
| 26x144 | 46.282 | ... | 3.846 | 178 | ... |
| **No. 22**x26x 72 | 19.688 | 17.500 | 7.692 | 151 | 135 |
| 26x 84 | 22.969 | 20.417 | 6.593 | 151 | 135 |
| 26x 96 | 26.250 | 23.334 | 5.769 | 151 | 135 |
| 26x108 | 29.532 | 26.250 | 5.128 | 151 | 135 |
| 26x120 | 32.813 | 29.167 | 4.615 | 151 | 135 |
| 26x144 | 39.376 | ... | 3.846 | 151 | ... |
| **No. 24**x26x 72 | 16.188 | 14.000 | 7.692 | 125 | 108 |
| 26x 84 | 18.886 | 16.334 | 6.593 | 125 | 108 |
| 26x 96 | 21.584 | 18.667 | 5.769 | 125 | 108 |
| 26x108 | 24.282 | 21.000 | 5.128 | 125 | 108 |
| 26x120 | 26.980 | 23.334 | 4.615 | 125 | 108 |
| 26x144 | 32.376 | ... | 3.846 | 125 | ... |
| **No. 26**x26x 72 | 12.688 | 10.500 | 7.692 | 98 | 81 |
| 26x 84 | 14.803 | 12.250 | 6.593 | 98 | 81 |
| 26x 96 | 16.917 | 14.000 | 5.769 | 98 | 81 |
| 26x108 | 19.032 | 15.750 | 5.128 | 98 | 81 |
| 26x120 | 21.146 | 17.500 | 4.615 | 98 | 81 |
| 26x144 | 25.376 | ... | 3.846 | 98 | .. |
| **No. 28**x26x 72 | 10.938 | 8.750 | 7.692 | 84 | 67 |
| 26x 84 | 12.761 | 10.209 | 6.593 | 84 | 67 |
| 26x 96 | 14.584 | 11.667 | 5.769 | 84 | 67 |
| 26x108 | 16.407 | 13.125 | 5.128 | 84 | 67 |
| 26x120 | 18.230 | 14.584 | 4.615 | 84 | 67 |
| 26x144 | 21.876 | ..... | 3.846 | 84 | ..... |

27½" widths can also be furnished promptly from stock.

* A square consists of 100 sq. ft. of sheets after corrugating, but before laying, and does not allow for side and end laps. Sheets 26" wide after corrugating cover 24" to the weather when laid with one corrugation side lap. Sheets 27½" wide after corrugating cover 24" to the weather when laid with 1½ corrugation side lap. End lap varies with conditions.

**Intermediate Lengths** cut from flat coils and corrugated, can be quickly supplied. A reasonable minimum order requirement applies.

# STANDARD ROOFING AND SIDING DATA

## FINISHED WIDTHS OF CORRUGATED SHEETS

| Width before Corrugating | Approximate Finished Width | |
|---|---|---|
| | 1¼" Corrugation | 2½" Corrugation |
| 26" | 23⅝" | 24⅛" |
| 28" | 25½" | 25⅞" |
| 30" | 27¼" | 27¾" |
| 36" | 32¾" | 33⅜" |

Note: To find width of sheet before corrugating, multiply width of sheet after corrugating by 1.08 for sheets with 2½" corrugations—by 1.11 for sheets with 1¼" corrugations.

## SAFE LOADS—PER SHEET—UNIFORMLY DISTRIBUTED

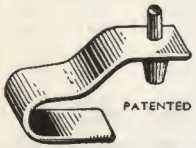
(Supports at Ends Only. Sheets, 26 Inches Wide.)

| | Gauge → | 28 | 27 | 26 | 24 | 22 | 20 | 18 | 16 |
|---|---|---|---|---|---|---|---|---|---|
| 2½" Corrugations | 6'0" Span | 88 | 97 | 106 | 141 | 176 | 211 | 282 | 352 |
| | 7'0" Span | 75 | 83 | 91 | 121 | 151 | 181 | 242 | 302 |
| | 8'0" Span | 66 | 73 | 79 | 106 | 132 | 158 | 211 | 264 |
| | 9'0" Span | 59 | 65 | 70 | 94 | 117 | 141 | 188 | 235 |
| | 10'0" Span | 53 | 58 | 63 | 85 | 106 | 127 | 169 | 211 |
| 1¼" Corrugations | 6'0" Span | 53 | 58 | 63 | 85 | 106 | 127 | 169 | 211 |
| | 7'0" Span | 45 | 50 | 55 | 73 | 91 | 109 | 145 | 181 |
| | 8'0" Span | 40 | 44 | 47 | 64 | 79 | 95 | 127 | 158 |
| | 9'0" Span | 35 | 39 | 42 | 56 | 70 | 85 | 113 | 141 |
| | 10'0" Span | 32 | 34 | 38 | 51 | 64 | 76 | 101 | 127 |

⅝ inch is taken as depth of 2½ inch corrugation, ⅜ inch as depth of 1¼ inch corrugations.

The following formula has been used: $W = \frac{99900\ t\ b\ d}{L}$

L = Supported length of sheet in inches. t = Thickness of sheet in inches.
b = Width of sheet in inches. d = Depth of corrugations in inches.
W = Breaking weight distributed in pounds.
$\frac{W}{4}$ = Safe loads per sheet between supports.

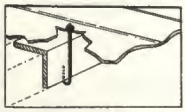



## THE PATTERSON CLIP

For fastening corrugated roofing or siding to practically any type of structural steel shape. An improvement over the strap fastener because of the time saved in installation and the elimination of play between the corrugated sheet and structural shape.

Packed 1,000 to the carton including washers. Shipping weight 69 lbs. per carton. Also shipped in bulk. Net weight, 15 clips to the pound. Each clip furnished with a steel burr.

## LEAD HEADED NAILS AND FASTENERS



*For securing corrugated sheets to structurals*

| Size in Inches | Ga. | Approx. Number per Lb. | Size in Inches | Ga. | Approx. Number per Lb. | Size in Inches | Ga. | Approx. Number per Lb. |
|---|---|---|---|---|---|---|---|---|
| 1¾* | 10 | 83 | 6 | 10 | 27 | 10 | 10 | 18 |
| 4 | 10 | 33 | 7 | 10 | 24 | 12 | 10 | 16 |
| 5 | 10 | 30 | 8 | 10 | 22 | | | |

* This size only is a lead headed nail.

Two pounds of lead headed nails (approximately 165—No. 10 x 1¾ lead headed roofing nails) are required to lay one Square (100 square feet). 25 to 30 Patterson clips are generally required for 100 square feet of roofing.

One gallon of paint will cover approximately 400 square feet of corrugated roofing.

# *Hot Rolled Bars*


**ROUNDS**

*Merchant Bar Quality*
- AISI C 1020 . . . . . 60
- ASTM A7 . . . . . 60
- Galvanized . . . . . 60
- Concrete Reinforcing . . . . . 19

*Special Bar Quality*
- AISI C 1020 . . . . . 61
- AISI C 1035 . . . . . 61
- AISI C 1045 . . . . . 61
- AISI C 1117 . . . . . 61
- AISI C 1141 . . . . . 61
- AISI C 1095 . . . . . 70

Forgings . . . . . 62, 69
Gagger Bars . . . . . 63

**SQUARES**

*Merchant Bar Quality*
- AISI C 1020 . . . . . 63

*Special Bar Quality*
- AISI C 1020 . . . . . 63
- AISI C 1045 . . . . . 63

Galvanized . . . . . 63

**OVALS**

AISI C 1020, *Merchant Bar Quality* . . . . . 64

**HALF OVALS, HALF ROUNDS**

AISI C 1020, *Merchant Bar Quality* . . . . . 64

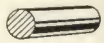
**STRIP**

.15 Max. Carbon . . . . . 65

**FLATS**

AISI C 1020, *Merchant Bar Quality* . . . . . 66
AISI C 1045, *Merchant Bar Quality* . . . . . 69
AISI C 1095, *Special Bar Quality* . . . . . 70
Round Edge Flats . . . . . 70
Galvanized . . . . . 68
Pickled and Oiled . . . . . 69
Perforated Hanger Iron . . . . . 70

## HOT ROLLED ROUNDS



MERCHANT BAR QUALITY—OPEN HEARTH

**AISI C 1020 ROUNDS**

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Ft. | Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Ft. |
|---|---|---|---|---|---|
| 3/16 | 0.094 | 12,16 | 1 5/16 | 4.60 | 16 |
| 1/4 | 0.167 | 12,16 | 1 3/8 | 5.05 | 16,20,36 |
| 5/16 | 0.261 | 16,20,36 | 1 7/16 | 5.52 | 16 |
| 3/8 | 0.376 | 16,20 | 1 1/2 | 6.01 | 16,20,36 |
| 7/16 | 0.511 | 16 | 1 5/8 | 7.05 | 16,36 |
| 1/2 | 0.668 | 16,20 | 1 3/4 | 8.18 | 16,20,36 |
| 9/16 | 0.845 | 16 | 1 7/8 | 9.39 | 16,36 |
| 5/8 | 1.04 | 16,20 | 2 | 10.68 | 16,20,36 |
| 11/16 | 1.26 | 16 | 2 1/8 | 12.06 | 16,20 |
| 3/4 | 1.50 | 16,20 | 2 1/4 | 13.52 | 16,36 |
| 13/16 | 1.76 | 16 | 2 3/8 | 15.06 | 16 |
| 7/8 | 2.04 | 16,20,36 | 2 1/2 | 16.69 | 16,36 |
| 15/16 | 2.35 | 16 | 2 5/8 | 18.40 | 16 |
| 1 | 2.67 | 16,20,36 | 2 3/4 | 20.19 | 16,36 |
| 1 1/16 | 3.01 | 16 | 2 7/8 | 22.07 | 16 |
| 1 1/8 | 3.38 | 16,20,36 | 3" and over see Special Bar Quality, next page. | | |
| 1 3/16 | 3.77 | 16 | | | |
| 1 1/4 | 4.17 | 16,20,36 | | | |

**ASTM A-7 ROUNDS**

| | | | | | |
|---|---|---|---|---|---|
| 3/8 | 0.376 | 35 | 5/8 | 1.04 | 50 |
| 7/16 | 0.511 | 40 | 11/16 | 1.26 | 50 |
| 1/2 | 0.668 | 50 | 3/4 | 1.50 | 55 |
| 9/16 | 0.845 | 50 | 13/16 | 1.76 | 55 |

**GALVANIZED AISI C 1020 ROUNDS** HOT DIP PROCESS

| | | | | | |
|---|---|---|---|---|---|
| 3/8 | .395 | 16 | 5/8 | 1.09 | 16 |
| 1/2 | .701 | 16 | 3/4 | 1.58 | 16 |

All stock size Hot Rolled Rounds can be quickly galvanized, to order.

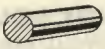
**CONCRETE RE-BARS** *(Refer to Building Products section)*

**Merchant Bar Quality** is a low carbon hot rolled steel sometimes spoken of as "soft" steel or "mild" steel. Easily welded, machined, and formed, it is used for general production and repair work, machine parts, welding jobs, bracing, etc. It is not particularly recommended for forging, heat treating or complicated machine operations.

In producing Merchant Bar Quality, only a minimum discard is made from each ingot, but bars of this quality should be free from visible piping. Seams and other surface irregularities may be present but are not objectionable for the purposes for which this quality is recommended. Chemistry is subject to ladle analysis only.

**Special Bar Quality** steel is manufactured under additional controls in rolling and surface preparation. Sufficient discard is made from each ingot to avoid injurious piping. To minimize surface imperfections, blooms and billets are carefully inspected and prepared by chipping, scarfing, and grinding before they are rolled into bars. Chemistry is subject to ladle and check analyses. This quality is desirable when more exact requirements exist for machining and heat treatment.

## HOT ROLLED ROUNDS



SPECIAL BAR QUALITY—OPEN HEARTH

*Suitable for Hammer Forgings*

**AISI C 1020** Identification Color: Green
**AISI C 1035** Identification Color: Blue
**AISI C 1045** Identification Color: Yellow
**AISI C 1117** Identification Color: Gold
**AISI C 1141** Identification Color: Brown

**C 1020**—A low carbon general purpose machinery steel, suitable for ordinary hammer forging and case hardening. This steel is readily weldable.

**C 1035**—An intermediate carbon machinery steel higher in strength and hardness than low carbon steel. Used for studs, bolts, medium duty shafts, etc.

**C 1045**—A higher carbon machinery steel used where still greater tensile strength and hardness in the as-rolled condition is required. This steel can be hammer forged and will respond to heat treatment. Suitable for flame and induction hardening. Uses include gears, shafts, axles, bolts and studs, machinery parts.

**C 1117**—A widely used type of case hardening steel, C 1117 bars develop a uniformly hard case and a strong, tough core. Machinability is about 85% of AISI B 1112. Used for medium duty shafts, studs, pins and other machine parts.

**C 1141**—A medium carbon steel with strength and toughness coupled with good machinability. Heat treatment response is uniformly good. Recommended for axles, shafts, bolts, pins, etc. where strength and machinability are needed.

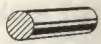
*For Mechanical Properties and Chemical Analysis refer to the Data section in back of book.*

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | | | | |
|---|---|---|---|---|---|---|
| | | C 1020 | C 1035 | C 1045 | C 1117 | C1141 |
| 3/8 | 0.376 | 18 | | N.Y. | 18 | Clev. |
| 7/16 | 0.511 | .. | .. | .. | Bost. | Bost. |
| 1/2 | 0.668 | .. | 18 | 18 | 18 | 18 |
| 9/16 | 0.845 | .. | .. | .. | Bost. | Phil. |
| 5/8 | 1.04 | 18 | | 18 | 18 | 18 |
| 11/16 | 1.26 | .. | .. | .. | Bost. | Bost. |
| 3/4 | 1.50 | .. | 18 | 18 | 18 | 18 |
| 13/16 | 1.76 | .. | .. | .. | Bost. | 18 |
| 7/8 | 2.04 | 18 | | 18 | 18 | 18 |
| 15/16 | 2.35 | .. | .. | .. | Bost. | Bost. |
| 1 | 2.67 | .. | 18 | 18 | 18 | 18 |
| 1 1/16 | 3.01 | .. | .. | .. | Bost. | Bost. |
| 1 1/8 | 3.38 | 18 | | 18 | 18 | 18 |
| 1 3/16 | 3.77 | .. | .. | .. | Bost. | Bost. |
| 1 1/4 | 4.17 | .. | 18 | 18 | 18 | 18 |
| 1 5/16 | 4.60 | .. | .. | .. | Bost. | Bost. |
| 1 3/8 | 5.05 | 18 | | 18 | 18 | 18 |
| 1 7/16 | 5.52 | .. | .. | .. | Bost. | N.Y. |
| 1 1/2 | 6.01 | .. | 18 | 18 | 18 | 18 |
| 1 9/16 | 6.52 | .. | .. | .. | Bost. | Bost. |
| 1 5/8 | 7.05 | 18 | | 18 | 18 | 18 |
| 1 11/16 | 7.60 | .. | .. | .. | .. | Bost. |
| 1 3/4 | 8.18 | .. | 18 | 18 | 18 | 18 |
| 1 13/16 | 8.77 | .. | .. | .. | .. | Bost. |
| 1 7/8 | 9.39 | .. | 18 | 18 | 18 | 18 |
| 1 15/16 | 10.02 | | | | | Bost. |

(Continued)

## HOT ROLLED ROUNDS

SPECIAL BAR QUALITY—OPEN HEARTH



| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | | | | |
|---|---|---|---|---|---|---|
| | | C 1020 | C 1035 | C 1045 | C 1117 | C 1141 |
| (Continued) | | | | | | |
| 2 | 10.68 | 20 | 20 | 20 | 18 | 18 |
| 2⅛ | 12.06 | .. | 20 | 20 | 18 | 18 |
| 2¼ | 13.52 | .. | 20 | 20 | 18 | 18 |
| 2⅜ | 15.06 | .. | 20 | 20 | 18 | 18 |
| 2⅞ | 15.87 | .. | .. | .. | .. | Bost. |
| 2½ | 16.69 | 20 | 20 | 20 | 18 | 18 |
| 2⅝ | 18.40 | .. | 20 | 20 | 18 | 18 |
| 2¾ | 20.19 | .. | 20 | 20 | 18 | 18 |
| 2⅞ | 22.07 | .. | 20 | 20 | 18 | Cinc. |
| 3 | 24.03 | 20 | 20 | 20 | 20 | 20 |
| 3⅛ | 26.08 | 20 | 20 | 20 | 20 | 20 |
| 3¼ | 28.21 | 20 | 20 | 20 | 20 | 20 |
| 3⅜ | 30.42 | 20 | 20 | 20 | 20 | 20 |
| 3½ | 32.71 | 10,20 | | 10,20 | 10,20 | 10,20 |
| 3⅝ | 35.09 | 10,20 | .. | 10,20 | 10,20 | 10,20 |
| 3¾ | 37.55 | 10,20 | .. | 10,20 | 10,20 | 10,20 |
| 3⅞ | 40.10 | Phil. | .. | 10,20 | 10,20 | 10,20 |
| 4 | 42.73 | 10,20 | | 10,20 | 10,20 | 10,20 |
| 4⅛ | 45.44 | 10,20 | .. | Clev. | Bost. | 10,20 |
| 4¼ | 48.23 | 10,20 | .. | 10,20 | 10,20 | 10,20 |
| 4⅜ | 51.11 | 10,20 | .. | .. | N.Y. | Cinc. |
| 4½ | 54.08 | 10,20 | | 10,20 | 10,20 | 10,20 |
| 4⅝ | 57.12 | 10,20 | .. | Clev. | Bost. | 10,20 |
| 4¾ | 60.25 | 10,20 | .. | 10,20 | 10,20 | 10,20 |
| 4⅞ | 63.46 | .. | .. | .. | Bost. | Bost. |
| 5 | 66.76 | 10,20 | | 10,20 | 10,20 | 10,20 |
| 5¼ | 73.60 | 10,20 | .. | 10,20 | 10,20 | 10,20 |
| 5½ | 80.78 | 10,20 | .. | 10,20 | 10,20 | 10,20 |
| 5⅝ | 84.49 | .. | .. | .. | Bost. | Bost. |
| 5¾ | 88.29 | 10,20 | | 10,20 | 10,20 | 10,20 |
| 6 | 96.13 | 10,20 | .. | 10,20 | 10,20 | 10,20 |
| 6⅛ | 100.18 | 10,20 | .. | .. | .. | .. |
| 6¼ | 104.31 | 10,20 | .. | 10,20 | 10,20 | 10,20 |
| 6½ | 112.82 | 10,20 | | 10,20 | 10,20 | 10,20 |
| 6¾ | 121.67 | 10,20 | .. | 10,20 | Clev. | 10,20 |
| 7 | 130.85 | 10,20 | .. | 10,20 | 10,20 | 10,20 |
| 7¼ | 140.36 | 10,20 | .. | 10,20 | 10,20 | 10,20 |
| 7½ | 150.21 | 10,20 | | 10,20 | 10,20 | 10,20 |
| 7¾ | 160.39 | 10,20 | .. | 10,20 | Phil. | 10,20 |
| 8 | 170.90 | 10,20 | .. | 10,20 | 10,20 | 10,20 |
| 8¼ | 181.75 | 10,20 | .. | 10,20 | Bost. | Bost. |
| 8½ | 192.93 | 10,20 | | 10,20 | Bost. | Bost. |
| 8¾ | 204.45 | 10,20 | .. | 10,20 | Bost. | .. |
| 9 | 216.30 | 10,20 | .. | 10,20 | Bost. | Bost. |
| 9¼ | 228.50 | .. | .. | .. | Bost. | .. |
| 9½ | 241.00 | 10,20 | | 10,20 | Bost. | Bost. |
| **FORGED ROUNDS:** *Forged Oversize—Smooth or Double Swaged Forged* | | | | | | |
| 9¾ | 253.85 | † | | 16 | | |
| 10 | 267.04 | 18-20* | .. | 16 | .. | .. |
| 10½ | 294.41 | † | .. | 16 | .. | .. |
| 11 | 323.11 | † | | 16 | | |
| 11½ | 353.15 | † | .. | 16 | .. | .. |
| 12 | 384.53 | † | .. | 16 | .. | .. |
| 12⅛ | 388.53 | Det.* | .. | .. | .. | .. |
| 13 | 451.28 | † | | † | | |

*10" and 12⅛" are Rough Turned after forging.
†These sizes may be forged to order on a prompt delivery basis.

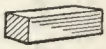
*For Rycase and Rytense machinery steels see Alloy Section*

## HOT ROLLED SQUARES

MERCHANT BAR QUALITY **AISI C 1020**
SPECIAL BAR QUALITY (*Suitable for hammer forgings*)
**AISI C 1020** Identification Color: Green
**AISI C 1045** Identification Color: Yellow

| Size in Inches | Wt. per Ft. in Lbs. | Merchant Bar Quality | Special Bar Quality | |
|---|---|---|---|---|
| | | C 1020 | C 1020 | C 1045 |
| ¼ | 0.213 | 16 | .. | .. |
| 5/16 | 0.332 | 16 | .. | .. |
| ⅜ | 0.478 | 16 | .. | .. |
| 7/16 | 0.651 | 16 | .. | .. |
| ½ | 0.850 | 16 | .. | N.Y. |
| 9/16 | 1.08 | 16 | .. | .. |
| ⅝ | 1.33 | 16 | .. | N.Y. |
| 11/16 | 1.61 | 16 | .. | .. |
| ¾ | 1.91 | 16 | .. | 18 |
| 13/16 | 2.24 | 16 | .. | .. |
| ⅞ | 2.60 | 16 | .. | 18 |
| 1 | 3.40 | 16 | .. | 18 |
| 1⅛ | 4.30 | 16 | .. | 18 |
| 1¼ | 5.31 | 16 | .. | 18 |
| 1⅜ | 6.43 | 16 | .. | .. |
| 1½ | 7.65 | 16 | .. | 18 |
| 1⅝ | 8.98 | 16 | .. | .. |
| 1¾ | 10.41 | 16 | .. | 18 |
| 1⅞ | 11.95 | 16 | .. | .. |
| 2 | 13.60 | 16 | .. | 18 |
| 2¼ | 17.21 | 16 | .. | 18 |
| 2½ | 21.25 | 16 | .. | 18 |
| 2⅝ | 23.43 | 16 | .. | .. |
| 2¾ | 25.71 | 16 | .. | 18 |
| 3 | 30.60 | .. | 20 | 20 |
| 3¼ | 35.91 | .. | 20 | .. |
| 3½ | 41.65 | .. | 20 | 20 |
| 3¾ | 47.81 | .. | 20 | .. |
| 4 | 54.40 | .. | 20 | 20 |
| 4½ | 68.85 | .. | 20 | Phil. |
| 5 | 85.00 | .. | 20 | 20 |
| 6 | 122.40 | .. | 20 | .. |

## GALVANIZED SQUARES



All sizes and qualities of regularly stocked Hot Rolled Squares can be quickly galvanized. We will gladly quote.

**NEW BILLET**
**DEFORMED**
**GAGGER BARS**

***For better, more firmly held foundry molds***

New Billet Deformed steel bars, unsurpassed for concrete reinforcement, are ideal for foundry gagger bar applications. Their pattern provides maximum grip, greatest bonding surface, and allows sand to pack more firmly around each gagger. As a result, these bars can be depended upon to hold the mold together more securely. Bars are furnished cut to any desired length and bent to any shape.

## HOT ROLLED OVALS

MERCHANT BAR QUALITY—OPEN HEARTH

**AISI C 1020**

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet |
|---|---|---|---|---|---|
| ½ x ¼ | .297 | 16 | ⅞ x 7/16 | .909 | 16 |
| ⅝ x 5/16 | .464 | 16 | | | |

## HOT ROLLED HALF OVALS

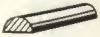
MERCHANT BAR QUALITY—OPEN HEARTH

**AISI C 1020**

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet |
|---|---|---|---|---|---|
| ⅝ x 3/16 | .284 | 20 | 1½ x 5/16 | 1.10 | 16 |
| 1 x ¼ | .594 | 16 | ⅜ | 1.34 | 16 |
| 1¼ x ¼ | .731 | N.Y.20 | 1¾ x ⅜ | 1.54 | 16 |
| 5/16 | .928 | 16 | 2 x ⅜ | 1.75 | Cinc.20 |
| 1½ x ¼ | .869 | Bost.12 | ½ | 2.38 | 16 |
| | | | 2½ x ⅜ | 3.71 | Phil.20 |

## HOT ROLLED HALF ROUNDS

MERCHANT BAR QUALITY—OPEN HEARTH



**AISI C 1020**

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet |
|---|---|---|---|---|---|
| ⅜ | .188 | Buff. | 1¼ | 2.09 | 16 |
| ½ | .334 | 16 | 1½ | 3.00 | 16 |
| ⅝ | .522 | 16 | 1¾ | 4.09 | 16 |
| ¾ | .751 | 16 | 2 | 5.34 | 16 |
| ⅞ | 1.02 | 16 | 2½ | 8.35 | 16 |
| 1 | 1.34 | 16 | 3 | 12.02 | 16 |

**Galvanized Bars**—All shapes and analyses of Hot Rolled Merchant Bar Quality bars can be quickly galvanized. We invite your orders and will be glad to quote.

**Flat Die Forgings**—Smooth forged or rough turned—are promptly supplied to your specifications in both carbon and alloy analyses. We welcome your inquiries for bars, or special shapes custom made to your blueprint.

# HOT ROLLED STRIP

## OPEN HEARTH—.15 MAXIMUM CARBON

*Test specimens withstand flat bends lengthwise and crosswise of strip.*

| B.W. Ga. & Size in Inches | | | Wt. per Ft. in Lbs. | Stock Lengths in Feet |
|---|---|---|---|---|
| **.065** (No. 16) | x | 3/8 | .083 | 16 |
| | | 1/2 | .110 | 16 |
| | | 5/8 | .138 | 16 |
| | | 3/4 | .166 | 16 |
| | | 7/8 | .193 | 16 |
| | | 1 | .221 | 16 |
| | | 1 1/8 | .248 | N.Y.16 |
| | | 1 1/4 | .276 | 16 |
| | | 1 1/2 | .331 | 16 |
| | | 1 3/4 | .386 | 16 |
| | | 2 | .442 | 16 |
| | | 2 1/4 | .497 | 16 |
| | | 2 1/2 | .552 | 16 |
| | | 3 | .662 | 16 |
| **.083** (No. 14) | x | 1/2 | .142 | 16 |
| | | 5/8 | .179 | 16 |
| | | 3/4 | .211 | 16 |
| | | 7/8 | .247 | 16 |
| | | 1 | .282 | 16 |
| | | 1 1/4 | .353 | 16 |
| | | 1 1/2 | .424 | 16 |
| | | 1 3/4 | .493 | 16 |
| | | 2 | .564 | 16 |
| | | 2 1/4 | .635 | 16 |
| | | 2 1/2 | .706 | 16 |
| | | 2 3/4 | .776 | 16 |
| | | 3 | .846 | 16 |
| | | 3 1/2 | .988 | 16 |
| | | 4 | 1.13 | 16 |
| **.109** (No. 12) | x | 3/8 | 0.139 | 16 |
| | | 1/2 | 0.185 | 16 |
| | | 5/8 | 0.232 | 16 |
| | | 3/4 | 0.278 | 16 |
| | | 7/8 | 0.324 | 16 |
| | | 1 | 0.371 | 16 |
| | | 1 1/8 | 0.416 | 16 |
| | | 1 1/4 | 0.463 | 16 |
| | | 1 1/2 | 0.556 | 16 |
| | | 1 3/4 | 0.648 | 16 |
| | | 2 | 0.742 | 16 |
| | | 2 1/4 | 0.834 | 16 |
| | | 2 1/2 | 0.926 | 16 |
| | | 3 | 1.11 | 16 |
| | | 3 1/2 | 1.30 | 16 |
| | | 4 | 1.48 | 16 |
| **.125** (1/8") | x | 3/8 | 0.159 | 16 |
| | | 1/2 | 0.213 | 16 |
| | | 5/8 | 0.266 | 16 |
| | | 3/4 | 0.319 | 16 |
| | | 7/8 | 0.372 | 16 |
| | | 1 | 0.425 | 16 |
| | | 1 1/8 | 0.478 | 16 |
| | | 1 1/4 | 0.531 | 16 |
| | | 1 3/8 | 0.584 | 16 |

| B.W. Ga. & Size in Inches | | | Wt. per Ft. in Lbs. | Stock Lengths in Feet |
|---|---|---|---|---|
| **.125** (1/8") | x | 1 1/2 | 0.638 | 16 |
| | | 1 3/4 | 0.744 | 16 |
| | | 2 | 0.850 | 16 |
| | | 2 1/4 | 0.956 | 16 |
| | | 2 1/2 | 1.06 | 16 |
| | | 2 3/4 | 1.17 | 16 |
| | | 3 | 1.28 | 16 |
| | | 3 1/4 | 1.38 | 16 |
| | | 3 1/2 | 1.49 | 16 |
| | | 4 | 1.70 | 16 |
| | | 4 1/2 | 1.91 | 16 |
| | | 5 | 2.13 | 16 |
| | | 5 1/2 | 2.34 | 16 |
| | | 6 | 2.55 | 16 |
| | | 8 | 3.40 | St.L.16 |
| | | 9 | . . . | Phil.20 |
| | | 10 | . . . | Phil.20 |
| | | 12 | | N.Y.16 |
| **.134** (No. 10) | x | 3/4 | 0.342 | 16 |
| | | 1 | 0.456 | 16 |
| | | 1 1/2 | 0.683 | 16 |
| | | 2 | 0.911 | 16 |
| | | 2 1/2 | 1.14 | 16 |
| **.1875** (3/16") | x | 3/8 | 0.239 | 16 |
| | | 1/2 | 0.319 | 16 |
| | | 5/8 | 0.398 | 16 |
| | | 3/4 | 0.478 | 16 |
| | | 7/8 | 0.558 | 16 |
| | | 1 | 0.638 | 16 |
| | | 1 1/8 | 0.717 | 16 |
| | | 1 1/4 | 0.797 | 16 |
| | | 1 3/8 | 0.877 | 16 |
| | | 1 1/2 | 0.956 | 16 |
| | | 1 3/4 | 1.12 | 16 |
| | | 2 | 1.28 | 16 |
| | | 2 1/4 | 1.43 | 16 |
| | | 2 1/2 | 1.59 | 16 |
| | | 2 3/4 | 1.75 | 16 |
| | | 3 | 1.91 | 16 |
| | | 3 1/4 | 2.07 | 16 |
| | | 3 1/2 | 2.23 | 16 |
| | | 4 | 2.55 | 16 |
| | | 4 1/2 | 2.87 | 16 |
| | | 5 | 3.19 | 16 |
| | | 5 1/2 | 3.51 | 16 |
| | | 6 | 3.83 | 16 |
| | | 7 | 4.46 | Det.8-16 |
| | | 8 | 5.10 | Det.8-16 |
| | | 9 | 5.74 | Det.8-16 |
| | | 10 | 6.38 | Det.8-16 |
| | | 12 | 7.65 | Pitt.8-20 |

*14"-48" incl.—see H.R. Sheets.*
*1/4" & heavier—see next page.*

**Galvanized and Pickled and Oiled Strip** can be furnished quickly from all stock sizes of Hot Rolled Strip.

**4130 Aircraft Quality Strip** *(See page 114)*

## HOT ROLLED FLATS

MERCHANT BAR QUALITY—OPEN HEARTH—SQUARE EDGE

**AISI C 1020**

*For sizes wider than 8", see plates on pages 30 thru 31.*

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet |
|---|---|---|
| **3/16** *and lighter— see page 44* | | |
| **1/4x** | | |
| 3/8 | 0.319 | 16 |
| 1/2 | 0.425 | 16 |
| 5/8 | 0.531 | 16 |
| 3/4 | 0.638 | 16 |
| 7/8 | 0.744 | 16 |
| 1 | 0.850 | 16,36 |
| 1 1/8 | 0.956 | 16 |
| 1 1/4 | 1.06 | 16 |
| 1 3/8 | 1.17 | 16 |
| 1 1/2 | 1.28 | 16,36 |
| 1 5/8 | 1.38 | 16 |
| 1 3/4 | 1.49 | 16 |
| 2 | 1.70 | 16,36 |
| 2 1/4 | 1.91 | 16 |
| 2 1/2 | 2.13 | 16 |
| 2 3/4 | 2.34 | 16 |
| 3 | 2.55 | 16 |
| 3 1/4 | 2.76 | 16 |
| 3 1/2 | 2.98 | 16 |
| 3 3/4 | 3.19 | 16 |
| 4 | 3.40 | 16,36 |
| 4 1/4 | 3.61 | 16 |
| 4 1/2 | 3.83 | 16 |
| 5 | 4.25 | 16 |
| 5 1/2 | 4.68 | 16 |
| 6 | 5.10 | 16,36 |
| 7 | 5.95 | 16 |
| 8 | 6.80 | 16,30 |
| **5/16x** | | |
| 1/2 | 0.531 | 16 |
| 5/8 | 0.664 | 16 |
| 3/4 | 0.797 | 16 |
| 7/8 | 0.930 | 16 |
| 1 | 1.06 | 16 |
| 1 1/8 | 1.20 | 16 |
| 1 1/4 | 1.33 | 16 |
| 1 3/8 | 1.46 | 16 |
| 1 1/2 | 1.59 | 16 |
| 1 3/4 | 1.86 | 16 |
| 2 | 2.13 | 16 |
| 2 1/4 | 2.39 | 16 |
| 2 1/2 | 2.66 | 16 |
| 2 3/4 | 2.92 | 16 |
| 3 | 3.19 | 16 |
| 3 1/4 | 3.45 | 16 |
| 3 1/2 | 3.72 | 16 |
| 4 | 4.25 | 16 |
| 4 1/2 | 4.78 | 16 |
| 5 | 5.31 | 16 |
| 5 1/2 | 5.84 | 16 |
| 6 | 6.38 | 16 |
| 7 | 7.44 | 16 |
| 8 | 8.50 | 16 |
| **3/8x** | | |
| 1/2 | 0.638 | 16 |
| 5/8 | 0.797 | 16 |
| 3/4 | 0.956 | 16 |
| 7/8 | 1.12 | 16 |
| 1 | 1.28 | 16 |
| 1 1/8 | 1.43 | 16 |
| 1 1/4 | 1.59 | 16 |
| 1 3/8 | 1.75 | 16 |
| 1 1/2 | 1.91 | 16,36 |
| 1 5/8 | 2.07 | 16 |
| 1 3/4 | 2.23 | 16 |
| 2 | 2.55 | 16,36 |
| 2 1/4 | 2.87 | 16 |
| 2 1/2 | 3.19 | 16 |
| 2 3/4 | 3.51 | 16 |
| 3 | 3.83 | 16 |
| 3 1/4 | 4.14 | 16 |
| 3 1/2 | 4.46 | 16,36 |
| 4 | 5.10 | 16,36 |
| 4 1/2 | 5.74 | 16 |
| 5 | 6.38 | 16 |
| 5 1/2 | 7.01 | 16 |
| 6 | 7.65 | 16 |
| 7 | 8.93 | 16 |
| 8 | 10.20 | 16,30 |
| **7/16x** | | |
| 3/4 | 1.12 | 16 |
| 7/8 | 1.30 | 16 |
| 1 | 1.49 | 16 |
| 1 1/4 | 1.86 | 16 |
| 1 3/8 | 2.05 | 16 |
| 1 1/2 | 2.23 | 16 |
| 1 3/4 | 2.60 | 16 |
| 2 | 2.98 | 16 |
| 2 1/4 | 3.35 | 16 |
| 2 1/2 | 3.72 | 16 |
| 3 | 4.46 | 16 |
| 3 1/2 | 5.21 | 16 |
| 4 | 5.95 | 16 |
| 4 1/2 | 6.69 | 16 |
| 5 | 7.44 | 16 |
| 5 1/2 | 8.18 | 16 |
| 6 | 8.93 | 16 |
| **1/2x** | | |
| 5/8 | 1.06 | 16 |
| 3/4 | 1.28 | 16 |
| 7/8 | 1.49 | 16 |
| 1 | 1.70 | 16 |
| 1 1/8 | 1.91 | 16 |
| 1 1/4 | 2.13 | 16 |
| 1 3/8 | 2.34 | 16 |
| 1 1/2 | 2.55 | 16,36 |
| 1 5/8 | 2.76 | 16 |

(Continued)

## HOT ROLLED FLATS

MERCHANT BAR QUALITY—OPEN HEARTH—SQUARE EDGE

**AISI C 1020**

*For sizes wider than 8", see plates on pages 30 thru 31.*

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet |
|---|---|---|
| (Continued) | | |
| **1/2x** | | |
| 1¾ | 2.98 | 16 |
| 2 | 3.40 | 16 |
| 2¼ | 3.83 | 16 |
| 2½ | 4.25 | 16,36 |
| 2¾ | 4.68 | 16 |
| 3 | 5.10 | 16,36 |
| 3¼ | 5.53 | 16 |
| 3½ | 5.95 | 16 |
| 4 | 6.80 | 16,36 |
| 4½ | 7.65 | 16 |
| 5 | 8.50 | 16 |
| 5½ | 9.35 | 16 |
| 6 | 10.20 | 16,36 |
| 7 | 11.90 | 16 |
| 8 | 13.60 | 16,30 |
| **5/8x** | | |
| ¾ | 1.59 | 16 |
| ⅞ | 1.86 | 16 |
| 1 | 2.13 | 16 |
| 1⅛ | 2.39 | 16 |
| 1¼ | 2.66 | 16 |
| 1⅜ | 2.92 | 16 |
| 1½ | 3.19 | 16 |
| 1⅝ | 3.45 | 16 |
| 1¾ | 3.72 | 16 |
| 2 | 4.25 | 16,36 |
| 2¼ | 4.78 | 16 |
| 2½ | 5.31 | 16 |
| 2¾ | 5.84 | 16 |
| 3 | 6.38 | 16,36 |
| 3¼ | 6.91 | 16 |
| 3½ | 7.44 | 16 |
| 4 | 8.50 | 16 |
| 4½ | 9.56 | 16 |
| 5 | 10.63 | 16 |
| 5½ | 11.69 | 16 |
| 6 | 12.75 | 16,36 |
| 7 | 14.88 | 16 |
| 8 | 17.00 | 16 |
| **3/4x** | | |
| ⅞ | 2.23 | 16 |
| 1 | 2.55 | 16 |
| 1⅛ | 2.87 | 16 |
| 1¼ | 3.19 | 16 |
| 1⅜ | 3.51 | Buff. |
| 1½ | 3.83 | 16 |
| 1⅝ | 4.14 | 16 |
| 1¾ | 4.46 | 16 |
| 2 | 5.10 | 16,36 |
| 2¼ | 5.74 | 16 |
| 2½ | 6.38 | 16 |
| 2¾ | 7.01 | 16 |
| 3 | 7.65 | 16,36 |
| 3¼ | 8.29 | 16 |

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet |
|---|---|---|
| **3/4x** | | |
| 3½ | 8.93 | 16 |
| 4 | 10.20 | 16,36 |
| 4½ | 11.48 | 16 |
| 5 | 12.75 | 16,36 |
| 5½ | 14.03 | 16 |
| 6 | 15.30 | 16,36 |
| 7 | 17.85 | 16 |
| 8 | 20.40 | 16 |
| **7/8x** | | |
| 1 | 2.98 | 16 |
| 1¼ | 3.72 | 16 |
| 1⅜ | 4.09 | 16 |
| 1½ | 4.46 | 16 |
| 1¾ | 5.21 | 16 |
| 2 | 5.95 | 16 |
| 2¼ | 6.69 | 16 |
| 2½ | 7.44 | 16 |
| 2¾ | 8.18 | 16 |
| 3 | 8.93 | 16 |
| 3¼ | 9.67 | Bost. |
| 3½ | 10.41 | 16 |
| 4 | 11.90 | 16 |
| 4½ | 13.39 | 16 |
| 5 | 14.88 | 16 |
| 5½ | 16.36 | 16 |
| 6 | 17.85 | 16 |
| 7 | 20.83 | 16 |
| 8 | 23.80 | 16 |
| **1x** | | |
| 1¼ | 4.25 | 16 |
| 1½ | 5.10 | 16 |
| 1¾ | 5.95 | 16 |
| 2 | 6.80 | 16,36 |
| 2¼ | 7.65 | 16 |
| 2½ | 8.50 | 16 |
| 2¾ | 9.35 | 16 |
| 3 | 10.20 | 16,36 |
| 3¼ | 11.05 | 16 |
| 3½ | 11.90 | 16 |
| 4 | 13.60 | 16,36 |
| 4½ | 15.30 | 16 |
| 5 | 17.00 | 16,36 |
| 5½ | 18.70 | 16 |
| 6 | 20.40 | 16 |
| 7 | 23.80 | 16 |
| 8 | 27.20 | 16 |
| **1-1/8x** | | |
| 2 | 7.65 | 16 |
| 2½ | 9.56 | Buff. |
| 3 | 11.48 | 16 |
| 4 | 15.30 | 16 |
| 5 | 19.13 | 16 |
| 6 | 22.95 | 16 |

(Continued)

## HOT ROLLED FLATS

MERCHANT BAR QUALITY—OPEN HEARTH—SQUARE EDGE

**AISI C 1020**

*For sizes wider than 8", see plates on pages 30 thru 31*

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet |
|---|---|---|
| (Continued) | | |
| **1-1/4x** | | |
| 1½ | 6.38 | 16 |
| 1¾ | 7.44 | 16 |
| 2 | 8.50 | 16 |
| 2¼ | 9.56 | 16 |
| 2½ | 10.63 | 16 |
| 2¾ | 11.69 | 16 |
| 3 | 12.75 | 16 |
| 3¼ | 13.81 | 16 |
| 3½ | 14.88 | 16 |
| 4 | 17.00 | 16 |
| 4½ | 19.13 | 16 |
| 5 | 21.25 | 16 |
| 5½ | 23.38 | 16 |
| 6 | 25.50 | 16 |
| 7 | 29.75 | 16 |
| 8 | 34.00 | 16 |
| **1-1/2x** | | |
| 1¾ | 8.93 | Clev. |
| 2 | 10.20 | 16 |
| 2¼ | 11.48 | 16 |
| 2½ | 12.75 | 16 |
| 2¾ | 14.03 | N.Y. |
| 3 | 15.30 | 16 |
| 3½ | 17.85 | 16 |
| 4 | 20.40 | 16 |
| 4½ | 22.95 | 16 |
| 5 | 25.50 | 16 |
| 5½ | 28.05 | 16 |
| 6 | 30.60 | 16 |
| 7 | 35.70 | 16 |
| *8 | 40.80 | 16 |
| **1-3/4x** | | |
| 2 | 11.90 | 16 |
| 2¼ | 13.39 | Bost. |
| 2½ | 14.88 | 16 |
| 2¾ | 16.36 | Bost. |
| 3 | 17.85 | 16 |
| 3½ | 20.83 | 16 |
| **1-3/4x** | | |
| 4 | 23.80 | 16 |
| 4½ | 26.78 | 16 |
| 5 | 29.75 | 16 |
| 5½ | 32.73 | 16 |
| 6 | 35.70 | 16 |
| *8 | 47.60 | St.L. |
| **2x** | | |
| 2¼ | 15.30 | N.Y. |
| 2½ | 17.00 | 16 |
| 3 | 20.40 | 16 |
| 3½ | 23.80 | 16 |
| 4 | 27.20 | 16 |
| 4½ | 30.60 | 16 |
| 5 | 34.00 | 16 |
| *6 | 40.80 | 16 |
| *7 | 47.60 | 16 |
| *8 | 54.40 | 16 |
| **2-1/4x** | | |
| 3 | 22.95 | Phil. |
| 4 | 30.60 | 20 |
| **2-1/2x** | | |
| 3 | 25.50 | 16 |
| 3½ | 29.75 | 16 |
| 4 | 34.00 | 16 |
| 4½ | 38.25 | 16 |
| *5 | 42.50 | 16 |
| *6 | 51.00 | 16 |
| *7 | 59.50 | Bost. |
| **3x** | | |
| *4 | 40.80 | 16 |
| *4½ | 45.90 | 16 |
| *5 | 51.00 | 16 |
| *6 | 61.20 | 16 |
| **3-1/2x** | | |
| *4 | 47.60 | Det. |
| **4x** | | |
| †6 | 81.60 | Det. |

* These sizes are *Special Bar Quality*.
† 4 x 6 is Smooth Forged to size.

## GALVANIZED FLATS

SQUARE EDGE—HOT DIP PROCESS

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet |
|---|---|---|
| ¼x ¾ | .67 | 16 |
| 1 | .89 | 16 |
| 1¼ | 1.11 | 16 |
| 1½ | 1.34 | 16 |
| ¼x2 | 1.79 | 16 |
| 3 | 2.68 | 16 |
| ⅜x1½ | 2.01 | 16 |
| 2 | 2.68 | 16 |

All sizes of regularly stocked flats can be galvanized to order.

## HOT ROLLED FLATS

MERCHANT BAR QUALITY—HIGH CARBON—OPEN HEARTH

**.40/.50 CARBON** Identification Color: Yellow

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet |
|---|---|---|
| **¼x** | | |
| 1 | 0.85 | 16 |
| 1¼ | 1.06 | 16 |
| 1½ | 1.28 | 16 |
| 2 | 1.70 | 16 |
| 2¼ | 1.91 | 16 |
| 2½ | 2.13 | 16 |
| 3 | 2.55 | 16 |
| 4 | 3.40 | 16 |
| 5 | 4.25 | 16 |
| 6 | 5.10 | 16 |
| **5/16x** | | |
| 1½ | 1.59 | 16 |
| **⅜x** | | |
| ⅝ | 0.80 | 16 |
| 1 | 1.28 | 16 |
| 1¼ | 1.59 | 16 |
| 1½ | 1.91 | 16 |
| 2 | 2.55 | 16 |
| 2¼ | 2.87 | 16 |
| 2½ | 3.19 | 16 |
| 3 | 3.83 | 16 |
| 3½ | 4.46 | 16 |
| 4 | 5.10 | 16 |
| 5 | 6.38 | 16 |
| 6 | 7.65 | 16 |
| **½x** | | |
| 1 | 1.70 | 16 |
| 1¼ | 2.13 | 16 |
| 1½ | 2.55 | 16 |
| 2 | 3.40 | 16 |
| 2½ | 4.25 | 16 |
| 3 | 5.10 | 16 |
| 4 | 6.80 | 16 |
| 5 | 8.50 | 16 |
| 6 | 10.20 | 16 |
| **⅝x** | | |
| 1½ | 3.19 | 16 |
| 2 | 4.25 | 16 |
| 2½ | 5.31 | 16 |
| 3 | 6.38 | 16 |
| 4 | 8.50 | 16 |
| 5 | 10.63 | 16 |
| **⅝x** | | |
| 6 | 12.75 | 16 |
| **¾x** | | |
| 1½ | 3.83 | 16 |
| 2 | 5.10 | 16 |
| 2½ | 6.38 | 16 |
| 3 | 7.65 | 16 |
| 4 | 10.20 | 16 |
| 5 | 12.75 | 16 |
| 6 | 15.30 | 16 |
| **⅞x** | | |
| 2 | 5.95 | 16 |
| 2½ | 7.44 | 16 |
| 3 | 8.93 | 16 |
| 4 | 11.90 | 16 |
| 6 | 17.85 | 16 |
| **1x** | | |
| 2 | 6.80 | 16 |
| 2½ | 8.50 | 16 |
| 3 | 10.20 | 16 |
| 4 | 13.60 | 16 |
| 5 | 17.00 | 16 |
| 6 | 20.40 | 16 |
| **1¼x** | | |
| 2 | 8.50 | 16 |
| 2½ | 10.63 | 16 |
| 3 | 12.75 | 16 |
| 4 | 17.00 | 16 |
| 5 | 21.25 | 16 |
| 6 | 25.50 | 16 |
| **1½x** | | |
| 2 | 10.20 | 16 |
| 2½ | 12.75 | 16 |
| 3 | 15.30 | 16 |
| 4 | 20.40 | 16 |
| 5 | 25.50 | 16 |
| 6 | 30.60 | 16 |
| **2x** | | |
| 2½ | 17.00 | 16 |
| 3 | 20.40 | 16 |
| 4 | 27.20 | 16 |
| 5 | 34.00 | 16 |
| *6 | 40.80 | 16 |

* This size is *Special Bar Quality*.

### PICKLED AND OILED FLATS

*Suitable for Stamping*

All sizes of regularly stocked flats may be pickled and oiled. We will be happy to quote prices.

**Flat Die Forgings**—Smooth forged or rough turned—are promptly supplied to your specifications in both carbon and alloy analyses. We welcome your inquiries for bars, or special shapes custom made to your blueprint.

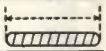
## SPRING STEEL

SPECIAL BAR QUALITY—OPEN HEARTH

**AISI C 1095** Identification Color: Pink

An automobile, farm implement spring steel that fills many requirements when inexpensive material is desired. Quality is uniform, finish good. Heat treats to spring tempers.

**HOT ROLLED FLATS (Round Edge Overall)**

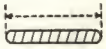


| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet |
|---|---|---|
| **1/4x** | | |
| 1½ | 1.243 | 16 |
| 1¾ | 1.456 | 16 |
| 2 | 1.668 | 16 |
| 2½ | 2.093 | 16 |
| 3 | 2.518 | 16 |
| **3/8x** | | |
| 1½ | 1.841 | 16 |
| 2½ | 3.116 | 16 |
| 3 | 3.753 | 16 |
| 3½ | 4.391 | 16 |
| 4 | 5.028 | 16 |
| 4½ | 5.666 | 16 |
| **1/2x** | | |
| 1½ | 2.422 | 16 |
| 2 | 3.272 | 16 |
| 2½ | 4.122 | 16 |
| 3 | 4.972 | 16 |
| 5 | 8.372 | 16 |
| 5½ | 9.222 | 16 |
| 6 | 10.070 | 16 |
| **5/8x** | | |
| 2 | 4.050 | 16 |
| 3 | 6.175 | 16 |

**HOT ROLLED ROUNDS**

| | | |
|---|---|---|
| ⅜ | 0.376 | 16 |
| 7/16 | 0.511 | 16 |
| ½ | 0.668 | 16 |
| ⅝ | 1.04 | 16 |
| ¾ | 1.50 | 16 |
| 1 | 2.67 | 16 |
| 1¼ | 4.17 | 16 |

## ROUND EDGE FLATS



MERCHANT BAR QUALITY—OPEN HEARTH

**AISI C 1020—Packing House Beef Rail**

| Size, In. Overall Meas. | Wt. per Ft., Lbs. | Stock Lgths., Ft. |
|---|---|---|
| ½x2½ | 4.12 | 16 |

**PERFORATED HANGER IRON**

| No. | Widths, Inches | Gauge | Hole Size Inches | Centers Inches | Wt. Per 100 Ft. Lbs. | Stock Lgths., Ft. |
|---|---|---|---|---|---|---|
| 0 | ¾ | 16 | ¼ | ½ | 13½ | 10 |
| 1 | ⅞ | 16 | ¼ | ½ | 14½ | 10 |
| 2 | 1 | 14 | 5/16 | ⅝ | 25 | 10 |
| 3 | 1⅛ | 12 | ⅜ | ¾ | 32 | 10 |

Hanger iron can be furnished galvanized.

# *Cold Finished Bars*


**ROUNDS**

C 1018 ..... 72
C 1042 ..... 72
C 1141 ..... 72
Stressproof ..... 72

*Screw Stock:*

Ledloy ..... 75
C 1213, B 1113 ..... 75
C 1212, B 1112 ..... 75
C 1117, Leaded C 1117 ..... 75

*Turned, Ground & Polished Shafting:*

C 1025 ..... 78
C 1045 ..... 78
C 1141 ..... 78

*Drawn, Ground & Polished Accuracy Stock:*

C 1213, B 1113 ..... 79
C 1212, B 1112 ..... 79
C 1141 ..... 79

**HEXAGONS**

C 1018 ..... 80
C 1117 ..... 80
Ledloy ..... 80
C 1213, B 1113 ..... 80
C 1042 ..... 80
C 1141 ..... 80

**SQUARES**

C 1018 ..... 81
Ledloy ..... 81
C 1213, B 1113 ..... 81
C 1212, B 1112 ..... 81
C 1042 ..... 81

**FLATS** (C 1018) ..... 82

**STRIPPER PLATE** ..... 86

**WIRE** ..... 87

**SPECIAL SHAPES** ..... 87

**TOLERANCES** ..... 227

**COLD FINISHED BARS** from Ryerson are produced from Special Bar Quality Hot Rolled Bars manufactured under special controls for chemistry, heating, rolling, cooling and surface preparation. Sufficient discard is made from each ingot to avoid injurious piping and harmful segregation. To minimize surface defects, blooms and billets are carefully inspected and prepared by chipping, scarfing, or grinding, before they are rolled into bars. These practices insure high quality hot rolled bars from which our cold finished bars are produced.

## COLD FINISHED ROUNDS

**AISI C1018** Identification Color: Green

**AISI C1042** Identification Color: Yellow

**AISI C1141** Identification Color: Brown

**STRESSPROOF** Identification Color: Brown & Yellow

**C1018**—An open hearth, low carbon steel with a medium manganese content. Has good case hardening properties, fair machinability and is excellent for cold bending and forming operations. Readily brazed and welded by any of the common processes. Suitable for general shafting purposes and for applications that do not require the greater strength of high carbon and alloy steels.

**C1042** represents the higher carbon range in the open hearth carbon group. Its mechanical property advantages over lower carbon steels prove valuable for shafting and similar applications. Good heat treatment response makes it useful for studs and special bolts. Machines to a much smoother finish than C1018. Higher carbon content in C1042 results in one of the strongest steels of the carbon grades (excluding alloy steels).

**C1141** is a comparatively free-machining steel for screw machine parts and applications where strength and fast, clean machining are required. Responds to heat treatment with more uniform results than steels of lower manganese content. Greater resistance to wear.

**STRESSPROOF** is a high manganese, medium carbon, free machining steel. Controlled mechanical and thermal treatment results in uniform, highly desirable mechanical properties, as follows:

*Strength:* The minimum yield point of bars—$\frac{3}{8}$" to 2" incl. is 100,000 psi with hardness about 269 Brinell; over 2", 90,000 psi, hardness about 248 Brinell. Hardness and mechanical properties are uniform from outside to center.

*Machinability:* 76% of B1112. Surface cutting speeds of about 125 feet per minute are recommended.

*Straightness:* May be keyseated, splined, threaded, broached, turned, or milled with minimum distortion. Expensive straightening operations are reduced or eliminated.

*Surface Wear:* Although easily machined, it possesses remarkable wear resisting properties—in many cases equalling the performance of case hardened steels.

*Uses:* Spindles, arbors, spline shafts, feed and lead screws, worm gears, propeller shafts, pump shafts, collets, etc.

*Size Tolerances:* 1" and smaller, +.000" to −.004"; over 1" thru 2", +.000" to −.006"; over 2", +.000" to −.008".

**RYTENSE** (*See page 98 for complete listing of Rytense.*)

## COLD FINISHED ROUNDS

**C 1018:** Cold Drawn thru 3½", Turned & Polished over 3½"

**C 1042, C 1141:** Cold Drawn thru 2⅞", Turned & Polished over 2⅞"

**Stressproof:** All Sizes Cold Drawn.

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet | | | |
|---|---|---|---|---|---|
| | | C 1018 | C 1042 | C 1141 | Stressproof |
| 1/8 | 0.042 | 10-12 | | | |
| 5/32 | 0.065 | 10-12 | .... | .... | .... |
| 3/16 | 0.094 | 10-12 | 10-12 | .... | .... |
| 1/4 | 0.167 | 10-12 | 14-16 | 10-12 | |
| 5/16 | 0.261 | 10-12 | 14-16 | 10-12 | .... |
| 3/8 | 0.376 | 10-12 | 14-16 | 10-12 | 11-14 |
| 7/16 | 0.511 | 10-12 | 14-16 | 10-12 | .... |
| 1/2 | 0.668 | 10-12 | 14-16 | 10-12 | 11-14 |
| 9/16 | 0.845 | 10-12 | 14-16 | 10-12 | 11-14 |
| 5/8 | 1.04 | 10-12 | 14-16 | 10-12 | 11-14 |
| 11/16 | 1.26 | 10-12 | 14-16 | Clev. | 11-14 |
| 3/4 | 1.50 | 18-20 | 14-16 | 10-12 | 11-14 |
| 13/16 | 1.76 | 18-20 | 14-16 | Clev. | 11-14 |
| 7/8 | 2.04 | 18-20 | 14-16 | 10-12 | 11-14 |
| 15/16 | 2.35 | 18-20 | 14-16 | 10-12 | 11-14 |
| 1 | 2.67 | 18-20 | 14-16 | 10-12 | 11-14 |
| 1/16 | 3.01 | 18-20 | 14-16 | Clev. | 11-14 |
| 1/8 | 3.38 | 18-20 | 14-16 | 10-12 | 11-14 |
| 3/16 | 3.77 | 18-20 | 14-16 | 10-12 | 11-14 |
| 1/4 | 4.17 | 18-20 | 14-16 | 10-12 | 11-14 |
| 5/16 | 4.60 | 18-20 | 14-16 | 10-12 | 11-14 |
| 3/8 | 5.05 | 18-20 | 14-16 | 10-12 | 11-14 |
| 7/16 | 5.52 | 18-20 | 14-16 | 10-12 | 11-14 |
| 1/2 | 6.01 | 18-20 | 14-16 | 10-12 | 11-14 |
| 9/16 | 6.52 | 18-20 | 14-16 | 10-12 | 11-14 |
| 5/8 | 7.05 | 18-20 | 14-16 | 10-12 | 11-14 |
| 11/16 | 7.60 | 18-20 | 14-16 | 10-12 | 11-14 |
| 3/4 | 8.18 | 18-20 | 14-16 | 10-12 | 11-14 |
| 13/16 | 8.77 | 18-20 | 14-16 | .... | 11-14 |
| 7/8 | 9.39 | 18-20 | 14-16 | 10-12 | 11-14 |
| 15/16 | 10.02 | 18-20 | 14-16 | 10-12 | 11-14 |
| 2 | 10.68 | 18-20 | 18-20 | 10-12 | 11-14 |
| 1/16 | 11.36 | 18-20 | .... | .... | .... |
| 1/8 | 12.06 | 18-20 | 18-20 | 10-12 | 11-14 |
| 3/16 | 12.78 | 18-20 | 18-20 | .... | .... |
| 1/4 | 13.52 | 18-20 | 18-20 | 10-12 | 11-14 |
| 5/16 | 14.28 | 18-20 | 18-20 | .... | .... |
| 3/8 | 15.06 | 18-20 | 18-20 | 10-12 | Clev. |
| 7/16 | 15.87 | 18-20 | 18-20 | Buff. | Clev. |
| 1/2 | 16.69 | 18-20 | 18-20 | 10-12 | 11-14 |
| 9/16 | 17.53 | 18-20 | .... | .... | .... |
| 5/8 | 18.40 | 18-20 | 18-20 | Clev. | 11-14 |
| 11/16 | 19.29 | 18-20 | 18-20 | Buff. | .... |
| 3/4 | 20.19 | 18-20 | 18-20 | Clev. | 11-14 |
| 13/16 | 21.12 | 18-20 | 18-20 | .... | .... |
| 7/8 | 22.07 | 18-20 | 18-20 | Clev. | Clev. |
| 15/16 | 23.04 | 18-20 | 18-20 | 10-12 | .... |
| 3 | 24.03 | 18-20 | 18-20 | Cinc. | 11-14 |
| 1/16 | 25.05 | 18-20 | .... | .... | .... |
| 1/8 | 26.08 | 18-20 | 18-20 | Clev. | .... |
| 3/16 | 27.13 | 18-20 | 18-20 | .... | .... |
| 1/4 | 28.21 | 18-20 | 18-20 | Cinc. | 11-14 |

(Continued)

## COLD FINISHED ROUNDS

**C 1018:** Cold Drawn thru 3½", Turned & Polished over 3½"

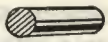
**C 1042, C 1141:** Cold Drawn thru 2⅞", Turned & Polished over 2⅞"

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet | | |
|---|---|---|---|---|
| | | C 1018 | C 1042 | C 1141 |
| (Continued) | | | | |
| 3 5/16 | 29.30 | 18-20 | | |
| 3/8 | 30.42 | 18-20 | 18-20 | |
| 7/16 | 31.55 | 18-20 | 18-20 | |
| 1/2 | 32.71 | 18-20 | 18-20 | Cinc. |
| 9/16 | 33.89 | 18-20 | | |
| 5/8 | 35.09 | 18-20 | 18-20 | |
| 11/16 | 36.31 | 18-20 | 18-20 | |
| 3/4 | 37.55 | 18-20 | 18-20 | Cinc. |
| 13/16 | 38.81 | 18-20 | | |
| 7/8 | 40.10 | 18-20 | 18-20 | |
| 15/16 | 41.40 | 18-20 | 18-20 | Cinc. |
| 4 | 42.73 | 18-20 | 18-20 | Cinc. |
| 1/8 | 45.44 | 18-20 | 18-20 | |
| 3/16 | 46.83 | 18-20 | 18-20 | |
| 1/4 | 48.23 | 18-20 | 18-20 | |
| 5/16 | 49.66 | 18-20 | | |
| 3/8 | 51.11 | 18-20 | 18-20 | |
| 7/16 | 52.58 | 18-20 | 18-20 | |
| 1/2 | 54.08 | 18-20 | 18-20 | |
| 9/16 | 55.59 | 18-20 | | |
| 5/8 | 57.12 | 18-20 | 18-20 | |
| 11/16 | 58.68 | 18-20 | 18-20 | |
| 3/4 | 60.25 | 18-20 | 18-20 | |
| 7/8 | 63.46 | 18-20 | Det. | |
| 15/16 | 65.10 | 18-20 | 18-20 | |
| 5 | 66.76 | 18-20 | 18-20 | |
| 1/16 | 68.44 | 18-20 | .... | |
| 1/8 | 70.14 | 18-20 | .... | |
| 3/16 | 71.86 | 18-20 | .... | |
| 1/4 | 73.60 | 18-20 | 18-20 | |
| 3/8 | 77.15 | 18-20 | .... | |
| 7/16 | 78.95 | 18-20 | 18-20 | |
| 1/2 | 80.78 | 18-20 | 18-20 | |
| 5/8 | 84.49 | 18-20 | | |
| 3/4 | 88.29 | 18-20 | 18-20 | |
| 7/8 | 92.17 | 18-20 | .... | |
| 15/16 | 94.14 | 18-20 | 18-20 | |
| 6 | 96.13 | 18-20 | 18-20 | |
| 1/4 | 104.31 | 18-20 | 18-20 | |
| 1/2 | 112.82 | 18-20 | 18-20 | |
| 3/4 | 121.67 | 18-20 | .... | |
| 7 | 130.85 | 18-20 | 18-20 | |
| 1/2 | 150.21 | 18-20 | .... | |
| 8 | 170.90 | 18-20 | | |
| 9 | 216.30 | 18-20 | .... | |
| 10 | 267.04 | 18-20 | | |

For Cold Finished Bar Tolerances, see page 88.

## SCREW STOCK

### COLD FINISHED ROUNDS



**LEDLOY** Identification Color: Purple

**AISI C 1213, B 1113** Identification Color: Orange
*(MX 1213, 1213X or 1213B High Speed Screw Stock)*

**AISI C 1212, B 1112** Identification Color: White

**AISI C 1117** Identification Color: Gold

**LEADED C 1117** Identification Color: Gold with Purple Dot

**LEDLOY,** a lead bearing open hearth steel, is the fastest machining steel presently produced. Case studies indicate it machines from 30 to 50% faster than the general Hi-Speed qualities such as B1113, C1213 or MX1213, etc. Parts made from Ledloy have a better finish and can be machined to closer tolerances, while tool life is greatly increased. A small percentage of lead, added by a special process, is responsible for the greatly increased machinability. And Ledloy retains all the advantages of open hearth steel—ductility, high impact values, transverse strength and effective carburizing qualities.

**C 1213 and B 1113***—These high speed steels reflect a recent change in the analysis of screw machine steels. Made to a restricted chemistry specification with a .09 max. carbon content, cutting speed and machining characteristics are second only to Ledloy. Machined finish is smooth and bright. C1213 is open hearth steel, B1113 Bessemer.

**C 1212 and B 1112** are free cutting steels with a machinability rating of 100. B1112 is produced in the Bessemer convertor, C1212 in the open hearth furnace. Used for machined parts and fittings such as bolts, nuts, studs, screws, small shafts, gears, etc. made on screw machines and lathes.

**C 1117** is an open hearth, high manganese steel with good machinability and excellent case carburizing properties. Machinability rating is within 10% of standard screw stock. When case hardened, case is hard, deep and uniform, supported by a tough, ductile core with core properties surpassed only by the more costly alloy steels. Withstands bending, broaching and most deforming without cracking.

**LEADED C 1117**—The addition of .15 to .35% lead to the basic C1117 analysis provides a carbon manganese steel ranking with B1113 in machinability. Same outstanding case hardening properties as C1117.

**RYCASE** *(see page 89 for complete listing of Rycase.)*

| Size In Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet | | | | |
|---|---|---|---|---|---|---|
| | | Ledloy | C 1213* B 1113 | C 1212 B 1112 | C 1117 | Leaded C 1117† |
| 3/32 | .023 | | 10-12 | 10-12 | | |
| 1/8 | .042 | 10-12 | 10-12 | 10-12 | .... | .... |
| 5/64 | .053 | 10-12 | .... | .... | .... | .... |
| 3/32 | .065 | 10-12 | 10-12 | 10-12 | .... | .... |
| 11/64 | .079 | 10-12 | .... | .... | .... | .... |
| 3/16 | .094 | 10-12 | 10-12 | 10-12 | 10-12 | |
| 13/64 | .110 | 10-12 | .... | .... | .... | .... |
| 7/32 | .128 | 10-12 | 10-12 | 10-12 | .... | .... |
| 15/64 | .147 | 10-12 | .... | .... | .... | .... |
| 1/4 | .167 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 17/64 | .188 | 10-12 | | | | |

(Continued)

* Also referred to as *MX1213, 1213X* or *1213B*. † In our Cleveland plant.

## SCREW STOCK

### COLD FINISHED ROUNDS

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet | | | | |
|---|---|---|---|---|---|---|
| | | Ledloy | C 1213* B 1113 | C 1212 B 1112 | C 1117 | Leaded C 1117† |
| (Continued) | | | | | | |
| 9/32 | .211 | 10-12 | 10-12 | 10-12 | | |
| 19/64 | .235 | 10-12 | .... | .... | .... | .... |
| 5/16 | .261 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 21/64 | .288 | 10-12 | .... | .... | .... | .... |
| 11/32 | .316 | 10-12 | 10-12 | 10-12 | | |
| 23/64 | .345 | 10-12 | .... | .... | .... | .... |
| 3/8 | .376 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 25/64 | .408 | 10-12 | .... | .... | .... | .... |
| 13/32 | .441 | 10-12 | 10-12 | 10-12 | 10-12 | |
| 27/64 | .475 | 10-12 | .... | .... | .... | .... |
| 7/16 | .511 | 10-12 | 10-12 | 10-12 | 1-012 | 10-12 |
| 29/64 | .548 | 10-12 | .... | .... | .... | .... |
| 15/32 | .587 | 10-12 | 10-12 | 10-12 | | |
| 31/64 | .627 | 10-12 | .... | .... | .... | .... |
| 1/2 | .668 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 33/64 | .710 | 10-12 | .... | .... | .... | .... |
| 17/32 | .754 | 10-12 | 10-12 | 10-12 | | |
| 9/16 | .845 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 37/64 | .893 | 10-12 | .... | .... | .... | .... |
| 19/32 | .941 | 10-12 | 10-12 | 10-12 | .... | .... |
| 39/64 | .992 | 10-12 | .... | .... | .... | .... |
| 5/8 | 1.04 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 41/64 | 1.10 | 10-12 | .... | .... | .... | .... |
| 21/32 | 1.15 | 10-12 | 10-12 | 10-12 | .... | .... |
| 11/16 | 1.26 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 23/32 | 1.38 | 10-12 | 10-12 | 10-12 | | |
| 47/64 | 1.44 | 10-12 | .... | .... | .... | .... |
| 3/4 | 1.50 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 25/32 | 1.63 | 10-12 | 10-12 | 10-12 | .... | .... |
| 13/16 | 1.76 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 27/32 | 1.90 | .... | 10-12 | 10-12 | .... | .... |
| 7/8 | 2.04 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 29/32 | 2.19 | 10-12 | 10-12 | 10-12 | .... | .... |
| 15/16 | 2.35 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 31/32 | 2.51 | 10-12 | .... | .... | .... | .... |
| 1 | 2.67 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 1/32 | 2.84 | .... | 10-12 | 10-12 | .... | .... |
| 1 1/16 | 3.01 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 1/8 | 3.38 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 3/16 | 3.77 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 1/4 | 4.17 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 5/16 | 4.60 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 3/8 | 5.05 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 7/16 | 5.52 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 1/2 | 6.01 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 9/16 | 6.52 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 5/8 | 7.05 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 11/16 | 7.60 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 3/4 | 8.18 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 13/16 | 8.77 | | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 7/8 | 9.39 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 15/16 | 10.02 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 | 10.68 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 1/16 | 11.36 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 1/8 | 12.06 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 3/16 | 12.78 | 10-12 | Clev. | Clev. | 10-12 | 10-12 |
| 2 1/4 | 13.52 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| (Continued) | | | | | | |

* Also referred to as *MX 1213, 1213X or 1213B.* † In our Cleveland plant.

## SCREW STOCK

### COLD FINISHED ROUNDS

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet | | | | |
|---|---|---|---|---|---|---|
| | | Ledloy | C 1213* B 1113 | C 1212 B 1112 | C 1117 | Leaded† C 1117 |
| (*Continued*) | | | | | | |
| 2 5/16 | 14.28 | | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 3/8 | 15.06 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 7/16 | 15.87 | .... | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 1/2 | 16.69 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 9/16 | 17.53 | | | | 10-12 | |
| 2 5/8 | 18.40 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 11/16 | 19.29 | .... | .... | .... | 10-12 | .... |
| 2 3/4 | 20.19 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 13/16 | 21.12 | | | | 10-12 | |
| 2 7/8 | 22.07 | Clev. | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 15/16 | 23.04 | .... | N.Y. | N.Y. | 10-12 | 10-12 |
| 3 | 24.03 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 3 1/16 | 25.05 | | | | Bost. | Bost. |
| 3 1/8 | 26.08 | Clev. | 10-12 | 10-12 | Phil. | 10-12 |
| 3 3/16 | 27.13 | .... | .... | .... | Chgo. | .... |
| 3 1/4 | 28.21 | Clev. | 10-12 | 10-12 | 10-12 | 10-12 |
| 3 3/8 | 30.42 | Clev. | | | Phil. | 10-12 |
| 3 7/16 | 31.55 | .... | .... | .... | Buff. | .... |
| 3 1/2 | 32.71 | Clev. | 10-12 | 10-12 | 10-12 | 10-12 |
| 3 5/8 | 35.09 | .... | .... | .... | Phil. | 10-12 |
| 3 3/4 | 37.55 | | 10-12 | 10-12 | 10-12 | 10-12 |
| 3 7/8 | 40.10 | .... | .... | .... | Bost. | 10-12 |
| 3 15/16 | 41.40 | .... | .... | .... | Cinc. | .... |
| 4 | 42.73 | .... | 10-12 | 10-12 | 10-12 | 10-12 |
| 4 1/8 | 45.44 | .... | .... | .... | 10-12 | Bost. |
| 4 1/4 | 48.23 | | | | 10-12 | 10-12 |
| 4 3/8 | 51.11 | .... | .... | .... | .... | Bost. |
| 4 1/2 | 54.08 | .... | .... | .... | 10-12 | 10-12 |
| 4 5/8 | 57.12 | .... | .... | .... | .... | Bost. |
| 4 3/4 | 60.25 | | | | 10-12 | 10-12 |
| 5 | 66.76 | .... | .... | .... | 10-12 | 10-12 |
| 5 1/8 | 70.14 | .... | .... | .... | .... | Bost. |
| 5 1/4 | 73.60 | .... | .... | .... | 10-12 | Bost. |
| 5 3/8 | 77.15 | | | | | Bost. |
| 5 1/2 | 80.78 | .... | .... | .... | 10-12 | Bost. |
| 5 5/8 | 84.49 | .... | .... | .... | .... | Bost. |
| 5 3/4 | 88.29 | .... | .... | .... | 10-12 | Bost. |
| 6 | 96.13 | | | | 10-12 | Bost. |

* This analysis is also referred to as *MX1213, 1213X* or *1213B*.
† In our Cleveland plant or as indicated.

Large stocks offer you an unequalled selection of types and sizes.

## SHAFTING

### TURNED, GROUND & POLISHED ROUNDS

**AISI C 1025** Identification Color: Red & Green
**AISI C 1045** Identification Color: Red & Yellow
**AISI C 1141** Identification Color: Red & Brown

**Finish**—Turned, Ground & Polished bars are recommended for shafts requiring extreme size accuracy, straightness and concentricity. When machined for key-seating and similar operations, distortion and warpage are held to a minimum. This is because all sizes are turned (drawing strains are not developed). The remarkable straightness minimizes vibration and bearing wear in high speed applications. *Caution:* Turned, Ground & Polished shafting is easily sprung, especially in small diameters, and the finish is easily marred. Use utmost care in handling.

**Properties**—C1025 is suitable for a wide range of applications. For greater strength C1045 or C1141 are frequently used. C1141 has better machinability, lowering production costs on lead screws, etc.

| | C 1025 | C 1045 | C 1141 |
|---|---|---|---|
| Minimum Yield Point, psi | 35,000 | 45,000 | 57,000 |
| Minimum Tensile Strength, psi | 55,000 | 75,000 | 95,000 |
| Machinability Rating | 52 | 55 | 67 |

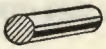
**Tolerances:** 1⅛" thru 2⅞", exact size to not more than .002" under
2½" thru 4", exact size to not more than .003" under
4¼" thru 6", exact size to not more than .005" under

| Size Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet C 1025 | C 1045 | C 1141 |
|---|---|---|---|---|
| 1⅛ | 3.38 | | 20 | |
| 1⅜ | 3.77 | St.L.20 | 20 | .. |
| 1¼ | 4.17 | St.L.20 | 20 | .. |
| 1⅝ | 4.60 | .. | .. | 12 |
| 1⅜ | 5.05 | St.L.20 | 20 | 12 |
| 1⅞ | 5.52 | St.L.20 | 20 | 12 |
| 1½ | 6.01 | 24 | 20 | 12 |
| 1⅝ | 6.52 | .. | Clev. | 12 |
| 1⅝ | 7.05 | 20 | Clev. | 12 |
| 1 11⁄16 | 7.60 | 16,20,24 | 20 | 12 |
| 1¾ | 8.18 | 16,20,24 | 20 | 12 |
| 1 13⁄16 | 8.77 | 20 | 20 | 12 |
| 1⅞ | 9.39 | 20 | Clev. | 12 |
| 1 15⁄16 | 10.02 | 16,20,24 | 20 | 12 |
| 2 | 10.68 | 16,20,24 | 20 | 12 |
| 2 1⁄16 | 11.36 | 20 | .. | .. |
| 2⅛ | 12.06 | 16 | 20 | .. |
| 2 3⁄16 | 12.78 | 16,20,24 | 20 | .. |
| 2¼ | 13.52 | 20,24 | 20 | .. |
| 2 5⁄16 | 14.28 | 20 | .. | .. |
| 2⅜ | 15.06 | 20 | Phil. | .. |
| 2 7⁄16 | 15.87 | 16,20,24 | 20 | .. |
| 2½ | 16.69 | 16,20,24 | 20 | .. |
| 2 9⁄16 | 17.53 | 24 | .. | .. |
| 2⅝ | 18.40 | 20 | Phil. | .. |
| 2 11⁄16 | 19.29 | 20,24 | 20 | .. |
| 2¾ | 20.19 | 16,20 | Clev. | .. |
| 2 13⁄16 | 21.12 | .. | 20 | .. |
| 2⅞ | 22.07 | 20 | 20 | .. |
| 2 15⁄16 | 23.04 | 16,20,24 | 20 | .. |
| 3 | 24.03 | 20 | 20 | .. |
| 3⅛ | 26.08 | 20 | .. | .. |
| 3⅜ | 27.13 | 20 | Clev. | .. |

(Continued)

## SHAFTING, *Continued*

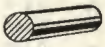
### TURNED, GROUND & POLISHED ROUNDS



| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | |
|---|---|---|---|
| | | C 1025 | C 1045 |
| 3 1/4 | 28.21 | 20 | 20 |
| 3 3/8 | 30.42 | .. | Phil. |
| 3 7/16 | 31.55 | 16,20,24 | 20 |
| 3 1/2 | 32.71 | 20 | 20 |
| 3 11/16 | 36.31 | 20 | .... |
| 3 3/4 | 37.55 | 20 | Phil. |
| 3 15/16 | 41.40 | 16,20,24 | Clev. |
| 4 | 42.73 | 16,20,24 | 20 |
| 4 1/4 | 48.23 | 20 | Clev. |
| 4 7/16 | 52.58 | 16,20,24 | Clev. |
| 4 1/2 | 54.08 | 20 | Phil. |
| 4 15/16 | 65.10 | 20 | 20 |
| 5 | 66.76 | 20 | Clev. |
| 5 1/2 | 80.78 | Phil.24 | Phil. |
| 6 | 96.13 | 20 | Phil. |

## ACCURACY STOCK

### DRAWN, GROUND & POLISHED



**AISI B 1113, C 1213** Identification Color: Red
*(MX 1213, 1213X or 1213B High Speed Screw Stock)*
**AISI B 1112, C 1212** Identification Color: Red
**AISI C 1141** Identification Color: Red and Brown

These analyses are screw stock qualities with a special finish used for instruments, electronic parts, machine shafts, etc. —extreme precision parts demanding utmost size accuracy, straightness and finish. Suitable for nickel plating.

**Tolerance:** Exact size to not more than .0005" plus or minus.

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet | | |
|---|---|---|---|---|
| | | B 1113 C 1213 | B 1112 C 1212 | C 1141 |
| 1/8 | 0.042 | 10-12 | 10-12 | .... |
| 5/32 | 0.065 | 10-12 | 10-12 | .... |
| 3/16 | 0.094 | 10-12 | 10-12 | 10-12 |
| 7/32 | 0.128 | 10-12 | 10-12 | .... |
| 1/4 | 0.167 | 10-12 | 10-12 | 10-12 |
| 9/32 | 0.211 | 10-12 | 10-12 | .... |
| 5/16 | 0.261 | 10-12 | 10-12 | 10-12 |
| 3/8 | 0.376 | 10-12 | 10-12 | 10-12 |
| 7/16 | 0.511 | 10-12 | 10-12 | 10-12 |
| 1/2 | 0.668 | 10-12 | 10-12 | 10-12 |
| 9/16 | 0.845 | 10-12 | 10-12 | .... |
| 5/8 | 1.04 | 10-12 | 10-12 | 10-12 |
| 11/16 | 1.26 | .... | .... | 10-12 |
| 3/4 | 1.50 | 10-12 | 10-12 | 10-12 |
| 13/16 | 1.76 | 10-12 | 10-12 | .... |
| 7/8 | 2.04 | 10-12 | 10-12 | 10-12 |
| 15/16 | 2.35 | 10-12 | 10-12 | 10-12 |
| 1 | 2.67 | 10-12 | 10-12 | 10-12 |
| 1 1/16 | 3.01 | 10-12 | 10-12 | 10-12 |
| 1 1/8 | 3.38 | 10-12 | 10-12 | 10-12 |
| 1 3/16 | 3.77 | 10-12 | 10-12 | 10-12 |
| 1 1/4 | 4.17 | 10-12 | 10-12 | 10-12 |
| 1 5/16 | 4.60 | 10-12 | 10-12 | .... |
| 1 3/8 | 5.05 | 10-12 | 10-12 | .... |
| 1 7/16 | 5.52 | 10-12 | 10-12 | .... |
| 1 1/2 | 6.01 | 10-12 | 10-12 | .... |

*Larger sizes can be selected from our Turned, Ground & Polished stock.*

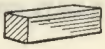
## COLD DRAWN HEXAGONS

**AISI C 1018** Identification Color: Green
**AISI C 1117** Identification Color: Gold
**LEDLOY** Identification Color: Purple
**AISI C 1213** Identification Color: Orange
*(MX 1213, 1213X or 1213B High Speed Screw Stock)*
**AISI B 1113** Identification Color: Orange
**AISI C 1042** Identification Color: Yellow
**AISI C 1141** Identification Color: Brown

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet | | | | | |
|---|---|---|---|---|---|---|---|
| | | C 1018 | C 1117 | Ledloy | C 1213* B 1113 | C 1042 | C 1141† |
| 1/8 | 0.046 | | | | 10-12 | | |
| 3/16 | 0.104 | .... | .... | .... | 10-12 | .... | .... |
| 1/4 | 0.184 | 10-12 | .... | 10-12 | 10-12 | .... | .... |
| 5/32 | 0.233 | .... | .... | .... | Clev. | .... | .... |
| 5/16 | 0.288 | | | 10-12 | 10-12 | | |
| 11/32 | 0.348 | .... | .... | .... | 10-12 | .... | .... |
| 3/8 | 0.414 | 10-12 | .... | 10-12 | 10-12 | .... | .... |
| 7/16 | 0.564 | .... | 10-12 | 10-12 | 10-12 | .... | 10-12 |
| 1/2 | 0.736 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 9/16 | 0.932 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 5/8 | 1.15 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 11/16 | 1.39 | 10-12 | .... | 10-12 | 10-12 | .... | 10-12 |
| 3/4 | 1.66 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 13/16 | 1.94 | 10-12 | | 10-12 | 10-12 | | 10-12 |
| 7/8 | 2.25 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 15/16 | 2.59 | .... | Phil. | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 | 2.94 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 1/16 | 3.32 | 10-12 | Phil. | 10-12 | 10-12 | | |
| 1 1/8 | 3.73 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 3/16 | 4.15 | ... | .... | .... | 10-12 | .... | .... |
| 1 1/4 | 4.60 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 5/16 | 5.07 | 10-12 | Buff. | | 10-12 | 10-12 | |
| 1 3/8 | 5.57 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 7/16 | 6.09 | 10-12 | Buff. | .... | 10-12 | .... | 10-12 |
| 1 1/2 | 6.63 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 9/16 | 7.19 | | | Clev. | | | |
| 1 5/8 | 7.78 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 11/16 | 8.39 | .... | .... | Clev. | 10-12 | .... | .... |
| 1 3/4 | 9.02 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 13/16 | 9.67 | 10-12 | Buff. | | 10-12 | | |
| 1 7/8 | 10.35 | 10-12 | Buff. | Clev. | 10-12 | 10-12 | 10-12 |
| 1 15/16 | 11.05 | .... | .... | .... | 10-12 | .... | .... |
| 2 | 11.78 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 1/16 | 12.53 | | | 10-12 | | | |
| 2 1/8 | 13.30 | Phil. | 10-12 | .... | .... | .... | .... |
| 2 3/16 | 14.09 | .... | 10-12 | .... | .... | .... | .... |
| 2 1/4 | 14.91 | 10-12 | 10-12 | 10-12 | .... | .... | .... |
| 2 3/8 | 16.61 | N.Y. | 10-12 | Clev. | | | |
| 2 1/2 | 18.40 | 10-12 | 10-12 | Clev. | .... | .... | .... |
| 2 5/8 | 20.29 | Phil. | 10-12 | Clev. | .... | .... | .... |
| 2 3/4 | 22.27 | N.Y. | 10-12 | Clev. | .... | .... | .... |
| 2 7/8 | 24.34 | | 10-12 | Clev. | | | |
| 3 | 26.50 | Phil. | 10-12 | Clev. | .... | .... | .... |
| 3 1/8 | 28.76 | .... | 10-12 | .... | .... | .... | .... |
| 3 1/4 | 31.10 | 10-12 | N.Y. | .... | .... | .... | .... |
| 3 1/2 | 36.07 | 10-12 | N.Y. | | | | |
| 3 3/4 | 41.41 | 10-12 | .... | .... | .... | .... | .... |
| 4 | 47.11 | 10-12 | N.Y. | | | | |

* Also referred to as *MX 1213, 1213X* or *12138*. † In our Cleveland plant.

## COLD DRAWN SQUARES



**AISI C 1018** Identification Color: Green

**LEDLOY** Identification Color: Purple

**AISI C 1212** Identification Color: White

**AISI B 1112** Identification Color: White

**AISI C 1213** Identification Color: Orange
*(MX 1213, 1213X or 1213B High Speed Screw Steel)*

**AISI B 1113** Identification Color: Orange

**AISI C 1042** Identification Color: Yellow

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet | | | | |
|---|---|---|---|---|---|---|
| | | C 1018 | Ledloy | C 1213* B 1113 | C 1212 B 1112 | C 1042 |
| 1/8 | 0.053 | 10-12 | | 10-12 | 10-12 | |
| 5/32 | 0.083 | .... | .... | 10-12 | 10-12 | .... |
| 3/16 | 0.120 | 10-12 | .... | 10-12 | 10-12 | .... |
| 7/32 | 0.163 | .... | .... | 10-12 | 10-12 | .... |
| 1/4 | 0.213 | 10-12 | 10-12 | 10-12 | 10-12 | |
| 5/16 | 0.332 | 10-12 | 10-12 | 10-12 | 10-12 | .... |
| 3/8 | 0.478 | 10-12 | 10-12 | 10-12 | 10-12 | .... |
| 7/16 | 0.651 | 10-12 | 10-12 | 10-12 | 10-12 | |
| 1/2 | 0.850 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 9/16 | 1.08 | 10-12 | 10-12 | 10-12 | 10-12 | .... |
| 5/8 | 1.33 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 11/16 | 1.61 | Cinc. | | 10-12 | 10-12 | |
| 3/4 | 1.91 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 13/16 | 2.24 | 10-12 | 10-12 | 10-12 | 10-12 | .... |
| 7/8 | 2.60 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 15/16 | 2.99 | 10-12 | 10-12 | 10-12 | 10-12 | |
| 1 | 3.40 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 1/16 | 3.84 | 10-12 | .... | 10-12 | 10-12 | .... |
| 1 1/8 | 4.30 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 3/16 | 4.80 | Phil. | | 10-12 | 10-12 | |
| 1 1/4 | 5.31 | 10-12 | 10-12 | .... | .... | 10-12 |
| 1 5/16 | 5.86 | 10-12 | .... | .... | .... | .... |
| 1 3/8 | 6.43 | 10-12 | 10-12 | .... | .... | .... |
| 1 7/16 | 7.03 | 10-12 | | | | |
| 1 1/2 | 7.65 | 10-12 | 10-12 | .... | .... | 10-12 |
| 1 9/16 | 8.30 | Phil. | .... | .... | .... | .... |
| 1 5/8 | 8.98 | 10-12 | .... | .... | .... | .... |
| 1 11/16 | 9.68 | Phil. | .... | .... | .... | .... |
| 1 3/4 | 10.41 | 10-12 | .... | .... | .... | .... |
| 1 7/8 | 11.95 | 10-12 | | | | |
| 2 | 13.60 | 10-12 | .... | .... | .... | 10-12 |
| 2 1/8 | 15.35 | 10-12 | .... | .... | .... | .... |
| 2 1/4 | 17.21 | 10-12 | .... | .... | .... | .... |
| 2 3/8 | 19.18 | 10-12 | | | | |
| 2 7/16 | 20.20 | Phil. | .... | .... | .... | .... |
| 2 1/2 | 21.25 | 10-12 | .... | .... | .... | .... |
| 2 5/8 | 23.43 | 10-12 | .... | .... | .... | .... |
| 2 3/4 | 25.71 | 10-12 | .... | .... | .... | .... |
| 2 7/8 | 28.10 | Phil. | | | | |
| 3 | 30.60 | 10-12 | .... | .... | .... | .... |
| 3 1/4 | 35.91 | 10-12 | .... | .... | .... | .... |
| 3 1/2 | 41.65 | 10-12 | | | | |
| 3 3/4 | 47.81 | 10-12 | .... | .... | .... | .... |
| 4 | 54.40 | 10-12 | .... | .... | .... | .... |
| 4 1/2 | 68.85 | 10-12 | | | | |

** This analysis is also referred to as 1213X, 1213B or MX 1213.*

## COLD DRAWN FLATS

**AISI C 1018** Identification Color: Green

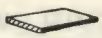
An open hearth, low carbon steel in the medium manganese content range. Has good case carburizing properties and can be cold formed and bent. Highly accurate as to size with a smooth finish and flat surfaces, square edges and good sharp corners. Suitable for all machining operations such as drilling, milling, planing, etc. Widely used for gauges, jigs and fixtures, and machinery and equipment parts.

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet |
|---|---|---|
| **1/8x** | | |
| 3/16 | 0.080 | 10-12 |
| 1/4 | 0.106 | 10-12 |
| 5/16 | 0.133 | 10-12 |
| 3/8 | 0.159 | 10-12 |
| 7/16 | 0.186 | 10-12 |
| 1/2 | 0.213 | 10-12 |
| 9/16 | 0.239 | 10-12 |
| 5/8 | 0.266 | 10-12 |
| 11/16 | 0.292 | 10-12 |
| 3/4 | 0.319 | 10-12 |
| 7/8 | 0.372 | 10-12 |
| 1 | 0.425 | 10-12 |
| 1 1/8 | 0.478 | 10-12 |
| 1 1/4 | 0.531 | 10-12 |
| 1 3/8 | 0.584 | 10-12 |
| 1 1/2 | 0.638 | 10-12 |
| 1 3/4 | 0.744 | 10-12 |
| 2 | 0.850 | 10-12 |
| 2 1/4 | 0.956 | 10-12 |
| 2 1/2 | 1.06 | 10-12 |
| 2 3/4 | 1.17 | 10-12 |
| 3 | 1.28 | 10-12 |
| 3 1/2 | 1.49 | 10-12 |
| 4 | 1.70 | 10-12 |
| 4 1/2 | 1.91 | 10-12 |
| 5 | 2.13 | 10-12 |
| 6 | 2.55 | 10-12 |
| **5/32x** | | |
| 3/8 | 0.199 | Clev. |
| 1/2 | 0.266 | Clev. |
| 5/8 | 0.332 | Clev. |
| 3/4 | 0.398 | Clev. |
| 7/8 | 0.465 | Clev. |
| 1 | 0.531 | Clev. |
| **3/16x** | | |
| 1/4 | 0.159 | 10-12 |
| 5/16 | 0.199 | 10-12 |
| 3/8 | 0.239 | 10-12 |
| 7/16 | 0.279 | 10-12 |
| 1/2 | 0.319 | 10-12 |
| 9/16 | 0.359 | 10-12 |
| 5/8 | 0.398 | 10-12 |
| 3/4 | 0.478 | 10-12 |
| 7/8 | 0.558 | 10-12 |
| 1 | 0.638 | 10-12 |
| 1 1/8 | 0.717 | 10-12 |

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet |
|---|---|---|
| **3/16x** | | |
| 1 1/4 | 0.797 | 10-12 |
| 1 3/8 | 0.877 | 10-12 |
| 1 1/2 | 0.956 | 10-12 |
| 1 3/4 | 1.12 | 10-12 |
| 1 7/8 | 1.20 | 10-12 |
| 2 | 1.28 | 10-12 |
| 2 1/4 | 1.43 | 10-12 |
| 2 1/2 | 1.59 | 10-12 |
| 2 3/4 | 1.75 | 10-12 |
| 3 | 1.91 | 10-12 |
| 3 1/4 | 2.07 | 10-12 |
| 3 1/2 | 2.23 | 10-12 |
| 4 | 2.55 | 10-12 |
| 4 1/2 | 2.87 | 10-12 |
| 5 | 3.19 | 10-12 |
| 6 | 3.83 | 10-12 |
| **1/4x** | | |
| 5/16 | 0.266 | 10-12 |
| 3/8 | 0.319 | 10-12 |
| 7/16 | 0.372 | 10-12 |
| 1/2 | 0.425 | 10-12 |
| 9/16 | 0.478 | 10-12 |
| 5/8 | 0.531 | 10-12 |
| 11/16 | 0.584 | 10-12 |
| 3/4 | 0.638 | 10-12 |
| 7/8 | 0.744 | 10-12 |
| 1 | 0.850 | 10-12 |
| 1 1/8 | 0.956 | 10-12 |
| 1 1/4 | 1.06 | 10-12 |
| 1 3/8 | 1.17 | 10-12 |
| 1 1/2 | 1.28 | 10-12 |
| 1 5/8 | 1.38 | 10-12 |
| 1 3/4 | 1.49 | 10-12 |
| 1 7/8 | 1.59 | 10-12 |
| 2 | 1.70 | 10-12 |
| 2 1/4 | 1.91 | 10-12 |
| 2 1/2 | 2.13 | 10-12 |
| 2 3/4 | 2.34 | 10-12 |
| 3 | 2.55 | 10-12 |
| 3 1/4 | 2.76 | 10-12 |
| 3 1/2 | 2.98 | 10-12 |
| 3 3/4 | 3.19 | N.Y. |
| 4 | 3.40 | 10-12 |
| 4 1/4 | 3.61 | N.Y. |
| 4 1/2 | 3.83 | 10-12 |

(Continued)

## COLD DRAWN FLATS



**AISI C 1018** Identification Color: Green

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet |
|---|---|---|
| (Continued) | | |
| **1/4x** | | |
| 5 | 4.25 | 10-12 |
| 5½ | 4.68 | Clev. |
| 6 | 5.10 | 10-12 |
| 8 | 6.80 | 10-12 |
| 10 | 8.50 | 10-12 |
| 12 | 10.20 | 10-12 |
| **5/16x** | | |
| ⅜ | 0.398 | 10-12 |
| 7/16 | 0.465 | 10-12 |
| ½ | 0.531 | 10-12 |
| 9/16 | 0.598 | 10-12 |
| ⅝ | 0.664 | 10-12 |
| ¾ | 0.797 | 10-12 |
| ⅞ | 0.930 | 10-12 |
| 1 | 1.06 | 10-12 |
| 1⅛ | 1.20 | 10-12 |
| 1¼ | 1.33 | 10-12 |
| 1⅜ | 1.46 | 10-12 |
| 1½ | 1.59 | 10-12 |
| 1¾ | 1.86 | 10-12 |
| 2 | 2.13 | 10-12 |
| 2¼ | 2.39 | 10-12 |
| 2½ | 2.66 | 10-12 |
| 2¾ | 2.92 | 10-12 |
| 3 | 3.19 | 10-12 |
| 3½ | 3.72 | 10-12 |
| 4 | 4.25 | 10-12 |
| 4½ | 4.78 | 10-12 |
| 5 | 5.31 | 10-12 |
| 6 | 6.38 | 10-12 |
| 8 | 8.50 | Det. |
| 10 | 10.63 | Det. |
| 12 | 12.75 | Det. |
| **3/8x** | | |
| 7/16 | 0.558 | 10-12 |
| ½ | 0.638 | 10-12 |
| 9/16 | 0.717 | 10-12 |
| ⅝ | 0.797 | 10-12 |
| 11/16 | 0.877 | 10-12 |
| ¾ | 0.956 | 10-12 |
| ⅞ | 1.12 | 10-12 |
| 1 | 1.28 | 10-12 |
| 1⅛ | 1.43 | 10-12 |
| 1¼ | 1.59 | 10-12 |
| 1⅜ | 1.75 | 10-12 |
| 1½ | 1.91 | 10-12 |
| 1⅝ | 2.07 | 10-12 |
| 1¾ | 2.23 | 10-12 |
| 1⅞ | 2.39 | 10-12 |
| 2 | 2.55 | 10-12 |
| 2¼ | 2.87 | 10-12 |
| 2½ | 3.19 | 10-12 |
| 2¾ | 3.51 | 10-12 |

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet |
|---|---|---|
| **3/8x** | | |
| 3 | 3.83 | 10-12 |
| 3¼ | 4.14 | 10-12 |
| 3½ | 4.46 | 10-12 |
| 3¾ | 4.78 | 10-12 |
| 4 | 5.10 | 10-12 |
| 4½ | 5.74 | 10-12 |
| 5 | 6.38 | 10-12 |
| 5½ | 7.01 | 10-12 |
| 6 | 7.65 | 10-12 |
| 8 | 10.20 | 10-12 |
| 10 | 12.75 | 10-12 |
| 12 | 15.30 | 10-12 |
| **7/16x** | | |
| ½ | 0.744 | 10-12 |
| 9/16 | 0.837 | 10-12 |
| ⅝ | 0.930 | 10-12 |
| ¾ | 1.12 | 10-12 |
| ⅞ | 1.30 | 10-12 |
| 1 | 1.49 | 10-12 |
| 1⅛ | 1.67 | 10-12 |
| 1¼ | 1.86 | 10-12 |
| 1½ | 2.23 | 10-12 |
| 1¾ | 2.60 | 10-12 |
| 2 | 2.98 | 10-12 |
| 2¼ | 3.35 | 10-12 |
| 2½ | 3.72 | 10-12 |
| 3 | 4.46 | 10-12 |
| 4 | 5.95 | 10-12 |
| 4½ | 6.69 | 10-12 |
| 5 | 7.44 | 10-12 |
| 6 | 8.93 | 10-12 |
| **1/2x** | | |
| 9/16 | 0.956 | 10-12 |
| ⅝ | 1.06 | 10-12 |
| 11/16 | 1.17 | 10-12 |
| ¾ | 1.28 | 10-12 |
| 13/16 | 1.38 | 10-12 |
| ⅞ | 1.49 | 10-12 |
| 1 | 1.70 | 10-12 |
| 1⅛ | 1.91 | 10-12 |
| 1¼ | 2.13 | 10-12 |
| 1⅜ | 2.34 | 10-12 |
| 1½ | 2.55 | 10-12 |
| 1⅝ | 2.76 | 10-12 |
| 1¾ | 2.98 | 10-12 |
| 2 | 3.40 | 10-12 |
| 2¼ | 3.83 | 10-12 |
| 2½ | 4.25 | 10-12 |
| 2¾ | 4.68 | 10-12 |
| 3 | 5.10 | 10-12 |
| 3¼ | 5.53 | 10-12 |
| 3½ | 5.95 | 10-12 |
| 4 | 6.80 | 10-12 |
| (Continued) | | |

## COLD DRAWN FLATS

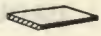
**AISI C 1018** Identification Color: Green

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet |
|---|---|---|
| (Continued) | | |
| **1/2x** | | |
| 4½ | 7.65 | 10-12 |
| 5 | 8.50 | 10-12 |
| 5½ | 9.35 | 10-12 |
| 6 | 10.20 | 10-12 |
| 8 | 13.60 | 10-12 |
| 10 | 17.00 | 10-12 |
| 12 | 20.40 | 10-12 |
| **9/16x** | | |
| ⅝ | 1.20 | 10-12 |
| ¾ | 1.43 | 10-12 |
| ⅞ | 1.67 | 10-12 |
| 1 | 1.91 | 10-12 |
| 1¼ | 2.39 | 10-12 |
| 1½ | 2.87 | 10-12 |
| 1¾ | 3.35 | 10-12 |
| 2 | 3.83 | 10-12 |
| 2½ | 4.78 | Clev. |
| **5/8x** | | |
| 1 1/16 | 1.46 | 10-12 |
| ¾ | 1.59 | 10-12 |
| ⅞ | 1.86 | 10-12 |
| 1 | 2.13 | 10-12 |
| 1⅛ | 2.39 | 10-12 |
| 1¼ | 2.66 | 10-12 |
| 1⅜ | 2.92 | 10-12 |
| 1½ | 3.19 | 10-12 |
| 1⅝ | 3.45 | 10-12 |
| 1¾ | 3.72 | 10-12 |
| 2 | 4.25 | 10-12 |
| 2¼ | 4.78 | 10-12 |
| 2½ | 5.31 | 10-12 |
| 2¾ | 5.84 | 10-12 |
| 3 | 6.38 | 10 12 |
| 3¼ | 6.91 | 10 12 |
| 3½ | 7.44 | 10-12 |
| 4 | 8.50 | 10-12 |
| 4½ | 9.56 | 10-12 |
| 5 | 10.63 | 10-12 |
| 5½ | 11.69 | 10-12 |
| 6 | 12.75 | 10-12 |
| 7 | 14.88 | N.Y. |
| 8 | 17.00 | 10-12 |
| 10 | 21.25 | 10-12 |
| 12 | 25.50 | 10-12 |
| **11/16x** | | |
| ¾ | 1.75 | 10-12 |
| 1 | 2.34 | 10-12 |
| **3/4x** | | |
| ⅞ | 2.23 | 10-12 |
| 1 | 2.55 | 10-12 |
| 1⅛ | 2.87 | 10-12 |
| 1¼ | 3.19 | 10-12 |

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet |
|---|---|---|
| **3/4x** | | |
| 1⅜ | 3.51 | 10-12 |
| 1½ | 3.83 | 10-12 |
| 1⅝ | 4.14 | 10-12 |
| 1¾ | 4.46 | 10-12 |
| 2 | 5.10 | 10-12 |
| 2¼ | 5.74 | 10-12 |
| 2½ | 6.38 | 10-12 |
| 2¾ | 7.01 | 10-12 |
| 3 | 7.65 | 10-12 |
| 3¼ | 8.29 | 10-12 |
| 3½ | 8.93 | 10-12 |
| 4 | 10.20 | 10-12 |
| 4½ | 11.48 | 10-12 |
| 5 | 12.75 | 10-12 |
| 5½ | 14.03 | 10-12 |
| 6 | 15.30 | 10-12 |
| 8 | 20.40 | 10-12 |
| 10 | 25.50 | 10-12 |
| 12 | 30.60 | 10-12 |
| **7/8x** | | |
| 1 | 2.98 | 10-12 |
| 1⅛ | 3.35 | 10-12 |
| 1¼ | 3.72 | 10-12 |
| 1⅜ | 4.09 | 10-12 |
| 1½ | 4.46 | 10-12 |
| 1¾ | 5.21 | 10-12 |
| 2 | 5.95 | 10-12 |
| 2¼ | 6.69 | 10-12 |
| 2½ | 7.44 | 10-12 |
| 2¾ | 8.18 | 10-12 |
| 3 | 8.93 | 10-12 |
| 3½ | 10.41 | 10-12 |
| 4 | 11.90 | 10-12 |
| 4½ | 13.39 | 10-12 |
| 5 | 14.88 | 10-12 |
| 6 | 17.85 | 10-12 |
| 8 | 23.80 | Det. |
| 10 | 29.75 | Det. |
| 12 | 35.70 | Det. |
| **1x** | | |
| 1⅛ | 3.83 | 10-12 |
| 1¼ | 4.25 | 10-12 |
| 1⅜ | 4.68 | 10-12 |
| 1½ | 5.10 | 10-12 |
| 1⅝ | 5.53 | 10-12 |
| 1¾ | 5.95 | 10-12 |
| 2 | 6.80 | 10-12 |
| 2¼ | 7.65 | 10-12 |
| 2½ | 8.50 | 10-12 |
| 2¾ | 9.35 | 10-12 |
| 3 | 10.20 | 10-12 |
| 3¼ | 11.05 | Clev. |
| 3½ | 11.90 | 10-12 |

(Continued)

## COLD DRAWN FLATS



**AISI C 1018** Identification Color: Green

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet |
|---|---|---|
| *(Continued)* | | |
| **1x** | | |
| 4 | 13.60 | 10-12 |
| 4½ | 15.30 | 10-12 |
| 5 | 17.00 | 10-12 |
| 5½ | 18.70 | 10-12 |
| 6 | 20.40 | 10-12 |
| 8 | 27.20 | 10-12 |
| 10 | 34.00 | 10-12 |
| 12 | 40.80 | 10-12 |
| **1-1/8x** | | |
| 1¼ | 4.78 | 10-12 |
| 1⅜ | 5.26 | 10-12 |
| 1½ | 5.74 | 10-12 |
| 1⅝ | 6.22 | 10-12 |
| 1¾ | 6.69 | 10-12 |
| 2 | 7.65 | 10-12 |
| 2¼ | 8.61 | 10-12 |
| 2½ | 9.56 | 10-12 |
| 3 | 11.48 | 10-12 |
| 4 | 15.30 | 10-12 |
| **1-1/4x** | | |
| 1⅜ | 5.84 | 10-12 |
| 1½ | 6.38 | 10-12 |
| 1⅝ | 6.91 | 10-12 |
| 1¾ | 7.44 | 10-12 |
| 1⅞ | 7.97 | 10-12 |
| 2 | 8.50 | 10-12 |
| 2¼ | 9.56 | 10-12 |
| 2½ | 10.63 | 10-12 |
| 2¾ | 11.69 | 10-12 |
| 3 | 12.75 | 10-12 |
| 3¼ | 13.81 | Clev. |
| 3½ | 14.88 | 10-12 |
| 4 | 17.00 | 10-12 |
| 4½ | 19.13 | 10-12 |
| 5 | 21.25 | 10-12 |
| 5½ | 23.38 | 10-12 |
| 6 | 25.50 | 10-12 |
| 8 | 34.00 | 10-12 |
| 10 | 42.50 | 10-12 |
| 12 | 51.00 | 10-12 |
| **1-3/8x** | | |
| 2 | 9.35 | 10-12 |
| 3 | 14.03 | 10-12 |
| **1-1/2x** | | |
| 1⅝ | 8.29 | 10-12 |
| 1¾ | 8.93 | 10-12 |
| 2 | 10.20 | 10-12 |
| 2¼ | 11.48 | 10-12 |
| 2½ | 12.75 | 10-12 |
| 2¾ | 14.03 | 10-12 |
| 3 | 15.30 | 10-12 |
| 3¼ | 16.57 | Clev. |
| 3½ | 17.85 | 10-12 |
| 4 | 20.40 | 10-12 |
| 4½ | 22.95 | 10-12 |
| 5 | 25.50 | 10-12 |

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet |
|---|---|---|
| **1-1/2x** | | |
| 5½ | 28.05 | 10-12 |
| 6 | 30.60 | 10-12 |
| 8 | 40.80 | 10-12 |
| 10 | 51.00 | 10-12 |
| 12 | 61.20 | 10-12 |
| **1-3/4x** | | |
| 2 | 11.90 | 10-12 |
| 2¼ | 13.39 | 10-12 |
| 2½ | 14.88 | 10-12 |
| 2¾ | 16.36 | 10-12 |
| 3 | 17.85 | 10-12 |
| 3½ | 20.83 | 10-12 |
| 4 | 23.80 | 10-12 |
| 4½ | 26.78 | 10-12 |
| 5 | 29.75 | 10-12 |
| 6 | 35.70 | 10-12 |
| **2x** | | |
| 2¼ | 15.30 | 10-12 |
| 2½ | 17.00 | 10-12 |
| 2¾ | 18.70 | 10-12 |
| 3 | 20.40 | 10-12 |
| 3¼ | 22.10 | Clev. |
| 3½ | 23.80 | 10-12 |
| 4 | 27.20 | 10-12 |
| 4½ | 30.60 | 10-12 |
| 5 | 34.00 | 10-12 |
| 6 | 40.80 | 10-12 |
| 8 | 54.40 | 10-12 |
| 10 | 68.00 | 10-12 |
| 12 | 81.60 | 10-12 |
| **2-1/4x** | | |
| 2½ | 19.13 | 10-12 |
| 2¾ | 21.04 | Clev. |
| 3 | 22.95 | 10-12 |
| 3¼ | 24.86 | 10-12 |
| 3½ | 26.78 | 10-12 |
| 4 | 30.60 | 10-12 |
| 4½ | 34.43 | 10-12 |
| 5 | 38.25 | 10-12 |
| 6 | 45.90 | 10-12 |
| **2-1/2x** | | |
| 2¾ | 23.38 | Clev. |
| 3 | 25.50 | 10-12 |
| 3½ | 29.75 | 10-12 |
| 4 | 34.00 | 10-12 |
| 4½ | 38.25 | Clev. |
| 5 | 42.50 | 10-12 |
| 6 | 51.00 | 10-12 |
| 8 | 68.00 | Det. |
| 10 | 85.00 | Det. |
| **3x** | | |
| 4 | 40.80 | 10-12 |
| 5 | 51.00 | 10-12 |
| 6 | 61.20 | 10-12 |
| 8 | 81.60 | 10-12 |
| 10 | 102.00 | 10-12 |
| 12 | 122.40 | 10-12 |

## GROUND AND POLISHED STRIPPER PLATE

**Hot Rolled .15/.25 Carbon Steel**

Original flatness was retained even though this plate underwent unusually heavy machining operations.

*Characteristics:* Both Surfaces are ground and polished to a thickness tolerance of plus or minus .003". Edges are planed instead of sheared or rolled, insuring parallel sides free from strains. Warping and distortion after machining is practically eliminated.
*Applications:* Jigs, moulds, dies, ejector plates, cams, fixtures, machine tables, etc.

When making certain types of dies, jigs, fixtures, tools, machine tables and other items requiring perfectly flat stock, its been common practice to use ordinary hot rolled mild steel plate and machine to size. To a degree this has proved satisfactory except for one troublesome and ever present factor—distortion or warping of the piece following the machining operation—which could only be overcome by expending additional time and labor, adding to costs. To satisfy the demand for material when the commercial grade of hot rolled steel plate is not sufficiently straight or flat, the Moltrup Steel Company developed a ground and polished plate free from the inert strains that, when released by machining, cause warpage. This makes it possible to produce stripper plates, dies, moulds, etc., in less time and at lower cost. The first step in the production of this special plate is the careful selection of hot rolled low carbon open hearth steel that measures up to exacting specifications. The steel is then straightened and flattened by special methods which relieve all rolling strains. The final operation consists of grinding and polishing both surfaces to a tolerance of plus or minus .003". Plates are cut to width on a planer, insuring parallel sides free from strains. The result is a smooth, accurately made steel plate which retains its true shape much better than ordinary hot rolled steel with machined surfaces. In addition to saving the costly labor of machining to size and flatness, the user of Ryerson ground and polished stripper plates avoids the loss of stock that results when an oversize plate is cut down to the exact dimensions required.

In our Buffalo plant or as indicated

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet | Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet |
|---|---|---|---|---|---|
| ¼ x 8 | 6.80 | 5 | ⅝ x 8 | 17.00 | 5 |
| 10 | 8.50 | 5 | 10 | 21.25 | 5 |
| 12 | 10.20 | 5 | 12 | 25.50 | 5 |
| 5/16 x 8 | 8.50 | 5 | 14 | 29.75 | N.Y. |
| 10 | 10.63 | 5 | ¾ x 8 | 20.40 | 5 |
| 12 | 12.75 | 5 | 10 | 25.50 | 5 |
| ⅜ x 8 | 10.20 | 5 | 12 | 30.60 | 5 |
| 10 | 12.75 | 5 | 14 | 35.70 | N.Y. |
| 12 | 15.30 | 5 | 1 x 8 | 27.20 | 5 |
| ½ x 8 | 13.60 | 5 | 10 | 34.00 | 5 |
| 10 | 17.00 | 5 | 12 | 40.80 | 5 |
| 12 | 20.40 | 5 | 14 | 47.60 | N.Y. |
| 14 | 23.80 | N.Y. | 1¼ x 14 | 59.50 | N.Y. |
| | | | 1½ x 14 | 71.40 | N.Y. |

# ROUND WIRE

In Coils

## BRIGHT BASIC

| Steel Wire Gauge or Size, Inches | Decimal Equivalent in Inches | Wt. per 100 Ft. in Lbs. | Steel Wire Gauge or Size, Inches | Decimal Equivalent in Inches | Wt. per 100 Ft. in Lbs. |
|---|---|---|---|---|---|
| 3/8 | .375 | 37.56 | 8 | .165 | 7.00 |
| 5/16 | .350 | 26.05 | 9 | .148 | 5.87 |
| 1/4 | .250 | 16.67 | 10 | .134 | 4.86 |
| 3 | .259 | 15.84 | 11 | .120 | 3.87 |
| 4 | .238 | 13.54 | 12 | .109 | 2.97 |
| 6 | .203 | 9.83 | 13 | .095 | 2.23 |
| 7 | .180 | 8.36 | | | |

## BLACK SOFT ANNEALED

| Steel Wire Gauge or Size, Inches | Decimal Equivalent in Inches | Wt. per 100 Ft. in Lbs. | Steel Wire Gauge or Size, Inches | Decimal Equivalent in Inches | Wt. per 100 Ft. in Lbs. |
|---|---|---|---|---|---|
| 3 | .259 | 15.84 | 11 | .120 | 3.87 |
| 4 | .238 | 13.54 | 12 | .109 | 2.97 |
| 5 | .220 | 11.43 | 13 | .095 | 2.23 |
| 6 | .203 | 9.83 | 14 | .083 | 1.71 |
| 7 | .180 | 8.36 | 15 | .072 | 1.38 |
| 8 | .165 | 7.00 | 16 | .065 | 1.04 |
| 9 | .148 | 5.87* | 18 | .049 | .60 |
| 10 | .134 | 4.86 | | | |

## SOFT GALVANIZED

| Steel Wire Gauge or Size, Inches | Decimal Equivalent in Inches | Wt. per 100 Ft. in Lbs. | Steel Wire Gauge or Size, Inches | Decimal Equivalent in Inches | Wt. per 100 Ft. in Lbs. |
|---|---|---|---|---|---|
| 3 | .259 | 16.63 | 11 | .120 | 4.06 |
| 6 | .203 | 10.32 | 12 | .109 | 3.12 |
| 7 | .180 | 8.78 | 13 | .095 | 2.34 |
| 8 | .165 | 7.35 | 14 | .083 | 1.80 |
| 9 | .148 | 6.16 | 16 | .065 | 1.09 |
| 10 | .134 | 5.10 | 18 | .049 | 0.63 |

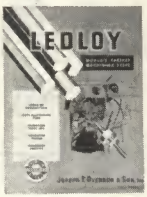
**We straighten and cut wire to order.**

## SPECIAL COLD DRAWN SHAPES MADE TO ORDER

We furnish special cold drawn shapes made to your exact requirements. From dies accurately made to order, a tailor-made cold drawn shape is produced. Orders are subject to standard mill regulations for delivery and minimum quantity.

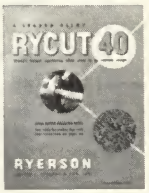
## HELPFUL RYERSON LITERATURE

The booklets and bulletins described below contain detailed information on the characteristics, applications, etc. of various steel and allied products. They will gladly be mailed to you upon request. Other Ryerson literature is frequently published, so if you are seeking more data on a product or service not shown here, please write or call us. We are anxious to help you in every way.




**Ledloy**—Illustrated booklet describing the fastest machining screw steel produced today. Gives case histories, machinability rating, tool life and mechanical properties of this leaded open hearth steel, proved in actual production to increase spindle speeds, save on tool grinding costs and down time, etc. Also included is a helpful table on cutting speeds and feeds.

**Open Steel Flooring**—Engineering data bulletin giving specifications for these strong, open steel panels used for flooring, grating and similar applications requiring the free passage of light and air, plus an illustrated listing of designs to fit your particular requirements.




**Faster Machining Leaded Alloy Steels**—Gives engineering data on Rycut—the world's fastest machining alloy steel—and includes case studies showing remarkable production increases and substantial savings in the cost of machined parts when Rycut is used to replace conventional alloys. Parts have a smoother, brighter surface and meet closer tolerances.

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**Allegheny Stainless Steel Bars**—Illustrated bulletin describing the types of stainless bars and their uses. A helpful guide in selecting stainless bars for best machinability, good welding results, greater resistance to heat and corrosion, and parts to be hardened. Also a listing of other analyses of stainless bars shipped from mill, and information on stainless sheets, etc.

**Ryex Expanded Metal**—Bulletin offers engineering data, illustrations of applications, sizes, etc., of this diamond pattern, solid joint, regular or flattened type open steel mesh. It is used for guards, enclosures, manufactured products, concrete reinforcement, grating and general construction.

# *Alloy and Tool Steel*

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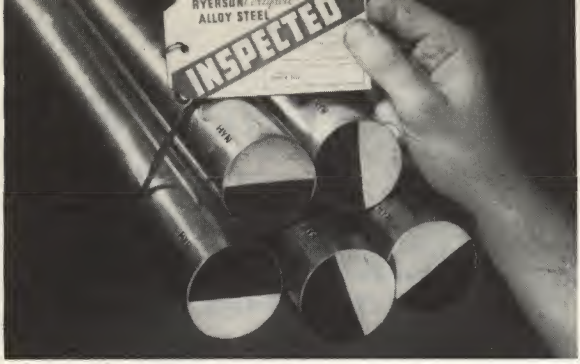



## The Ryerson ***Certified*** Alloy Steel Plan

***Ryerson Certified Alloy Steel*** is tops in quality. We make this statement without reservations. We take positive steps to guard its truthfulness with our Certified Alloy Steel Plan. And we back it up in writing with our Certificates of Analysis and Hardenability.

The Ryerson Certified Alloy Steel Plan assures you of alloys of dependable high quality with these *eight* steps:

### *1 Selection*

Each alloy steel is selected—*by individual heat*—to meet rigid Ryerson specifications for quality and analysis.

### *2 Verification*

Chemical analysis of *each heat* is verified to be sure these specifications have been met.

### *3 Spark Testing*

*Each shipment is* spark tested before acceptance for stock to eliminate the possibility of mixed steels.

### *4 Identification*

Positive identification of *each shipment* is assured by: (a) Heat Symbol stamped on or attached; (b) *Systematic* Color Identification of analysis painted on.

### *5 Hardenability Testing*

Hardenability of *each heat* is determined in our own laboratory by ASTM End-Quench Tests in which each heat of case hardening or direct hardening alloy is "test heat treated." Mechanical properties of alloys sold in the heat treated condition are certified by Ryerson to meet or exceed the minimums we require.

### *6 Hardenability Interpretation*

Results of Step 5 are interpreted for you into working data to be used as a guide in heat treating *your particular* steel or in confirming the actual mechanical properties of heat treated alloys.

### *7 Inspection*

*Every* customer's order is carefully inspected for size, finish; heat symbol, analysis, etc. at time of shipment.

### *8 Certification*

The Certificate of Analysis and Hardenability furnished with *each order* of case hardening and direct hardening alloy steel from Ryerson contains the complete data and history on *that exact* steel and is your written proof of its quality.

Only at Ryerson—*nowhere else*—can you get such a combination of quality extras—extra testing, extra information, extra protection and extra assurance of satisfaction, shipment after shipment.

## GUIDE TO SELECTION

The ability to develop a hard case supported by a tough core are basic features of case hardening alloys—developed in varying degrees in heat treating the alloys described below. Further details on how these alloys fit your application are available from experienced metallurgists at Ryerson.

Dependable quality is constantly guarded by the Ryerson Certified Alloy Steel Plan described on opposite page.

For additional case hardening alloys, *fastest machining* in their carbon ranges, see Rycut Series, pages 102–106.

**RYCASE®** Identification Color: Gold

A low carbon, Manganese steel with good machinability and case hardening characteristics. By using Rycase you gain due to special methods used in manufacture. Its advantage in machinability is shown by a rating of 90% of B 1112. In case hardening you gain improved uniformity of case hardening and depth. Years of satisfactory service prove the superiority of Rycase over plain low carbon steels.

**LEADED RYCASE®** Identification Color: Gold with Purple Dot

Lead addition further increases machinability compared with Rycase. User reports indicate a machinability rating of 125% of B 1112. Response to case hardening is same as Rycase with its uniform case and tough ductile core.

**AISI 8620** Identification Color: Orange & Green

**AISI E 8615** Identification Color: Orange & Green, White Dot

The most widely used case hardening alloys. Used where high strength and excellent wear coupled with a tough, ductile core are required. Balanced composition of Chromium, Nickel and Molybdenum makes safe hardening possible in a wide variety of heat treatments. Relatively low distortion and growth characteristics. Oil quenching recommended.

Stocks include plates as well as bars. Widely accepted as a gear steel. Also used for spindles, shafts, cams, bushings, pins, crankshafts, etc.

**LEADED 8620** Identification Color: Purple & Green

The addition of lead to the basic 8620 analysis improves finish, lengthens tool life and increases machinability—allowing use of speeds and feeds recommended for C 1117. This free machining property is accompanied with high strength, excellent wear and tough core characteristics. Heat treating procedures and forging practices are same as for 8620.

**AISI 4615-4620** Identification Color: White & Green

A fine grained Nickel Molybdenum case hardening alloy. When heat treated, it possesses a uniform case hardness and depth plus a tough core. An oil hardening steel with recognized minimum distortion and growth. Applications: gears, spindles, pump shafts, sucker rods, etc.

**E 9310 Annealed** Identification Color: Gold & Green

A low carbon high Nickel Chromium Molybdenum alloy popular in the aircraft industry. Offers uniform case hardness and depth plus exceptionally high core properties. On many applications this combination of excellent case and high strength core can be fully utilized. Sizes, page 119.

**NITRALLOY** (*See description on page 112.*)

## RYCASE • 4615-20 • 8620 • LEADED 8620

### HOT ROLLED ROUNDS

4615-20, 8620 and Leaded 8620 are Machine Straightened

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | | | |
|---|---|---|---|---|---|
| | | Rycase** | 4615-20 | 8620 | Leaded 8620 |
| 3/8 | 0.376 | 18 | | | |
| 1/2 | 0.668 | 18 | 14-16* | 16* | |
| 9/16 | 0.845 | Bost. | | | |
| 5/8 | 1.04 | 18 | | 16* | |
| 11/16 | 1.26 | Bost. | | | |
| 3/4 | 1.50 | 18 | 14-16* | 16* | |
| 13/16 | 1.76 | Bost. | | | |
| 7/8 | 2.04 | 18 | 14-16* | 16* | |
| 15/16 | 2.35 | Bost. | | | |
| 1 | 2.67 | 18 | 14-16* | 16* | |
| 1 1/16 | 3.01 | Bost. | | | |
| 1 1/8 | 3.38 | 18 | 14-16* | 16* | |
| 1 3/16 | 3.77 | Bost. | | | |
| 1 1/4 | 4.17 | 18 | 14-16* | 16* | |
| 1 5/16 | 4.60 | Bost. | | | |
| 1 3/8 | 5.05 | 18 | 14-16* | 16* | |
| 1 7/16 | 5.52 | Bost | | | |
| 1 1/2 | 6.01 | 18 | 14-16* | 16* | |
| 1 9/16 | 6.52 | Bost. | | | |
| 1 5/8 | 7.05 | 18 | 16 | 16 | |
| 1 3/4 | 8.18 | 18 | 16 | 16 | |
| 1 7/8 | 9.39 | 18 | 16 | 16 | |
| 2 | 10.68 | 18 | 16 | 16 | |
| 2 1/8 | 12.06 | 18 | 16 | 16 | |
| 2 1/4 | 13.52 | 18 | 16 | 16 | |
| 2 3/8 | 15.06 | 18 | | 16 | |
| 2 1/2 | 16.69 | 18 | 16 | 16 | |
| 2 5/8 | 18.40 | 18 | 16 | 16 | |
| 2 3/4 | 20.19 | 18 | 16 | 16 | |
| 2 7/8 | 22.07 | 18 | 14-16 | 16 | |
| 3 | 24.03 | 20 | 16 | 16 | |
| 3 1/8 | 26.08 | 20 | 18-20 | 16 | |
| 3 1/4 | 28.21 | 20 | 16 | 16 | 16 |
| 3 3/8 | 30.42 | 20 | | 18-20 | |
| 3 1/2 | 32.71 | 20 | 16 | 16 | 16 |
| 3 5/8 | 35.09 | 20 | 18-20 | 18-20 | |
| 3 3/4 | 37.55 | 20 | 16 | 16 | 16 |
| 3 7/8 | 40.10 | 20 | | | |

(*Continued*)

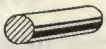
** A low carbon, manganese machinery steel. *See page 100 for Hexagons.*

* These sizes not machine straightened.

The above listed lengths (except those on which a length range is shown) are dead lengths. Bars as small as 5 ft. long may be shipped up to 10% of the total weight of any one order.

## RYCASE • 4615-20 • 8620 • LEADED 8620

**HOT ROLLED ROUNDS, *Continued***



| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | | | |
|---|---|---|---|---|---|
| | | Rycase* | 4615-20 | 8620 | Leaded 8620 |
| 4 | 42.73 | 20 | 16 | 16 | 16 |
| 4 1/8 | 45.44 | Bost. | .. | .. | .. |
| 4 1/4 | 48.23 | 20 | 16 | 16 | 16 |
| 4 3/8 | 51.11 | Bost. | .. | .. | .. |
| 4 1/2 | 54.08 | 20 | 16 | 16 | 16 |
| 4 5/8 | 57.12 | Bost. | .. | .. | .. |
| 4 3/4 | 60.25 | 20 | 16 | 16 | .. |
| 4 7/8 | 63.46 | Bost. | .. | .. | .. |
| 5 | 66.76 | 20 | 16 | 16 | 16 |
| 5 1/8 | 70.14 | Bost. | .. | .. | .. |
| 5 1/4 | 73.16 | 20 | 16 | 16 | .. |
| 5 3/8 | 77.15 | Bost. | .. | .. | .. |
| 5 1/2 | 80.78 | 20 | 16 | 16 | 16 |
| 5 5/8 | 84.49 | Bost. | .. | .. | .. |
| 5 3/4 | 88.29 | 20 | 16 | 16 | .. |
| 6 | 96.13 | 20 | 16 | 16 | 16 |
| 6 1/8 | 100.18 | .. | .. | .. | .. |
| 6 1/4 | 104.31 | 20 | 16 | 16 | .. |
| 6 1/2 | 112.82 | 20 | 16 | 16 | .. |
| 6 5/8 | 117.20 | | | | |
| 6 3/4 | 121.67 | Clev. | 18-20 | 16 | .. |
| 6 7/8 | 126.22 | .. | .. | .. | .. |
| 7 | 130.85 | 20 | 16 | 16 | .. |
| 7 1/4 | 140.36 | 20 | .. | N.Y. | .. |
| 7 1/2 | 150.21 | 20 | 16 | 16 | .. |
| 7 3/4 | 160.39 | Bost. | 18-20 | N.Y. | .. |
| 8 | 170.90 | 20 | 16 | 16 | |
| 8 1/4 | 181.75 | Bost. | .. | 16 | .. |
| 8 1/2 | 192.93 | Bost. | 18-20 | 16 | .. |
| 8 3/4 | 204.45 | Bost. | 18-20 | .. | .. |
| 9 | 216.30 | Bost. | 18-20 | 16 | |
| 9 1/4 | 228.50 | Bost. | .. | .. | .. |
| 9 1/2 | 241.00 | Bost. | 18-20 | 16 | .. |
| 9 3/4 | 253.9 | .. | .. | .. | .. |
| 10 | 267.0 | Bost.† | | 10-12†† | |
| 10 1/4 | 280.6 | .. | .. | Bost.† | .. |
| 10 1/2 | 294.4 | Bost.† | .. | .. | .. |
| 10 3/4 | 308.6 | .. | .. | Bost.† | .. |

* A low carbon, manganese machinery steel. *See page 100 for Hexagons.*

† These sizes are rough turned. †† Smooth forged to size.

The above listed lengths (except those on which a length range is shown) are dead lengths. Bars as small as 5' may be shipped up to 10% of the total weight of any one order.

## RYCASE • LEADED RYCASE 4615-20 • 8620 • LEADED 8620

### COLD FINISHED ROUNDS

*Rycase, Leaded Rycase:* Sizes 3⁹⁄₁₆″ and over are Turned & Polished
4615-20, 8620, *Leaded 8620:* 2¹⁵⁄₁₆″ & over are Turned & Pol.

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | | | | |
|---|---|---|---|---|---|---|
| | | Rycase* | Leaded Rycase** | 4615-20 | 8620 | Leaded 8620 |
| 3⁄16 | 0.094 | 10-12 | | | | |
| 1⁄4 | 0.167 | 10-12 | 10-12 | .... | 10-12 | .... |
| 5⁄16 | 0.261 | 10-12 | 10-12 | 10-12 | 10-12 | .... |
| 11⁄32 | 0.316 | 10-12 | | | | |
| 3⁄8 | 0.376 | 10-12 | 10-12 | 10-12 | 10-12 | .... |
| 7⁄16 | 0.511 | 10-12 | 10-12 | 10-12 | 10-12 | .... |
| 1⁄2 | 0.668 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 9⁄16 | 0.845 | 10-12 | 10-12 | 10-12 | 10-12 | .... |
| 5⁄8 | 1.04 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 11⁄16 | 1.26 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 3⁄4 | 1.50 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 13⁄16 | 1.76 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 7⁄8 | 2.04 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 15⁄16 | 2.35 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 | 2.67 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 1⁄16 | 3.01 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 1⁄8 | 3.38 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 3⁄16 | 3.77 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 1⁄4 | 4.17 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 5⁄16 | 4.60 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 3⁄8 | 5.05 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 7⁄16 | 5.52 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 1⁄2 | 6.01 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 9⁄16 | 6.52 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 5⁄8 | 7.05 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 11⁄16 | 7.60 | 10-12 | 10-12 | .... | 10-12 | .... |
| 1 3⁄4 | 8.18 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 13⁄16 | 8.77 | 10-12 | 10-12 | .... | .... | .... |
| 1 7⁄8 | 9.39 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 15⁄16 | 10.02 | 10-12 | 10-12 | .... | 10-12 | 10-12 |
| 2 | 10.68 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 1⁄16 | 11.36 | 10-12 | 10-12 | 10-12 | 10-12 | .... |
| 2 1⁄8 | 12.06 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 3⁄16 | 12.78 | 10-12 | 10-12 | | | |
| 2 1⁄4 | 13.52 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 5⁄16 | 14.28 | 10-12 | 10-12 | .... | .... | .... |
| 2 3⁄8 | 15.06 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 7⁄16 | 15.87 | 10-12 | 10-12 | | | |
| 2 1⁄2 | 16.69 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 9⁄16 | 17.53 | 10-12 | .... | .... | .... | .... |
| 2 5⁄8 | 18.40 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 11⁄16 | 19.29 | 10-12 | Bost. | | | |
| 2 3⁄4 | 20.19 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 13⁄16 | 21.12 | 10-12 | .... | .... | .... | .... |
| 2 7⁄8 | 22.07 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 15⁄16 | 23.04 | 10-12 | 10-12 | .... | .... | .... |
| 3 | 24.03 | 10-12 | 10-12 | 10-12 | 10-12 | 10-12 |
| 3 1⁄16 | 25.05 | 10-12 | Bost. | .... | .... | .... |
| 3 1⁄8 | 26.08 | 10-12 | 10-12 | .... | .... | .... |
| 3 3⁄16 | 27.13 | 10-12 | | | | |

(*Continued*)

* A low carbon, manganese machinery steel. See page 100 for Hexagons.
** In our Cleveland plant or as indicated.

## RYCASE · LEADED RYCASE
## 8620 · LEADED 8620

**COLD FINISHED ROUNDS, *Continued***

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | | | |
|---|---|---|---|---|---|
| | | Rycase* | Leaded Rycase** | 8620 | Leaded 8620 |
| 3¼ | 28.21 | 10-12 | 10-12 | 10-12 | 10-12 |
| 3 5/16 | 29.30 | Bost. | Bost. | .... | .... |
| 3⅜ | 30.42 | 10-12 | 10-12 | .... | .... |
| 3 7/16 | 31.55 | 10-12 | .... | .... | .... |
| 3½ | 32.71 | 10-12 | 10-12 | 10-12 | 10-12 |
| 3⅝ | 35.09 | 10-12 | 10-12 | .... | .... |
| 3¾ | 37.55 | 10-12 | 10-12 | 10-12 | .... |
| 3⅞ | 40.10 | 10-12 | 10-12 | .... | .... |
| 3 15/16 | 41.40 | Cinc. | .... | .... | .... |
| 4 | 42.73 | 10-12 | 10-12 | 10-12 | 10-12 |
| 4⅛ | 45.44 | 10-12 | Bost. | .... | .... |
| 4¼ | 48.23 | 10-12 | 10-12 | 10-12 | .... |
| 4⅜ | 51.11 | .... | Bost. | .... | .... |
| 4½ | 54.08 | 10-12 | 10-12 | 10-12 | 10-12 |
| 4⅝ | 57.12 | Bost. | Bost. | .... | .... |
| 4¾ | 60.25 | 10-12 | 10-12 | .... | .... |
| 5 | 66.76 | 10-12 | 10-12 | 10-12 | ..... |
| 5⅛ | 70.14 | .... | Bost. | .... | .... |
| 5¼ | 73.60 | 10-12 | Bost. | .... | .... |
| 5⅜ | 77.15 | .... | Bost. | .... | .... |
| 5½ | 80.78 | 10-12 | Bost. | ..... | ..... |
| 5⅝ | 84.49 | .... | Bost. | .... | .... |
| 5¾ | 88.29 | 10-12 | Bost. | .... | .... |
| 6 | 96.13 | 10-12 | Bost. | ..... | ..... |

* A low carbon, manganese machinery steel.
** In our Cleveland plant or as indicated.

## E 8615 PLATE

**Identification Color: Orange and Green**

The improved performance of E8615 oil hardening, case hardening alloy steel can now be yours in the form of plate steel. Ideal for flats, rings, discs and irregular shapes, it is accurately flame cut to your order by Ryerson technicians.

E8615 was developed especially for maximum strength and wear resistance in machine parts and other heavy-duty applications. It offers you more uniform case depth and hardness, higher core properties, greater strength, less distortion, more uniform wear characteristics and more reliable heat treatment response. Used for racks, bushings, gears, cams, fixtures, gauges, molds, ways, jigs, chuck jaws, die bases, etc.

**In our Boston plant**

| Size in Inches | Wt. per Ft. in Lbs. | Size in Inches | Wt. per Ft. in Lbs. |
|---|---|---|---|
| ½x72x246 | 122.40 | 2½x72x240 | 612.00 |
| ¾x72x240 | 183.60 | 2¾x72x180 | 673.20 |
| ⅞x72x240 | 214.20 | 3 x72x180 | 734.40 |
| 1 x72x246 | 244.80 | 3¼x72x180 | 795.60 |
| 1¼x72x240 | 306.00 | 3½x72x180 | 856.80 |
| 1½x72x240 | 367.20 | 4 x72x246 | 979.20 |
| 1¾x72x240 | 428.40 | 4½x72x222 | 1101.60 |
| 2 x72x246 | 489.60 | 5 x72x198 | 1224.00 |
| 2¼x72x240 | 550.80 | 6 x72x168 | 1468.80 |

## GUIDE TO SELECTION

### ANNEALED—MEDIUM CARBON ALLOYS

The steels in this group are medium carbon alloy steels. They feature high tensile strength combined with toughness and are usually heat treated by the conventional oil quench and temper method. Each steel provides specific properties and advantages so the user can be sure of getting the steel suited for each application.

High uniform quality assured by the Ryerson Certified Alloy Steel Plan means dependable performance, time after time. See page 90 for details of this unique, 8-point Certified Plan.

For additional direct hardening alloys that are the *fastest machining* alloy steels in their carbon ranges, see Rycut series, pages 102–106.

**RYTENSE** (As Rolled) Identification Color: Brown

**RYTENSE TG & P/ACCY.** Identification Colors: Brown & Red

These free-machining medium carbon manganese steels are produced under closely controlled practices. They offer valuable improvements in machinability and heat treatment response compared to many plain carbon steels. In the as rolled condition, Rytense has good strength and toughness. When heat treated, surface hardness is deeper and more uniform than that attainable with many plain carbon steels. In either condition it gives excellent results in a broad range of applications: shafts, gears, axles, pins, rollers, etc. Machinability rating: 75% of B1112.

**AISI 4140** Identification Color: Black & Yellow

One of the most extensively used alloys in the medium carbon group, this is a fine-grained chromium molybdenum alloy. Because of the exceptional range of strength and toughness attainable by variations in heat treatment, suitable mechanical properties for a great variety of service requirements can be developed. Widely used for pinions, shafts, gears, sprockets, clutch plates, oil tools, etc.

**LEADED 4140** Identification Color: Purple & Yellow

Because of its greatly improved machinability, leaded 4140 offers much faster production of parts with important per-unit savings in labor and machine time, together with the versatility of 4140 steel. It is regularly heat treated and forged with the practices used for 4140. Frequently selected for spindles, adapters, sleeves, power take-off shafts, automatically machined products, etc.

**AISI 4340** Identification Color: White & Yellow

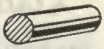
A highly alloyed chromium nickel molybdenum steel developed for massive heavy duty parts. The rich alloy content assures deep hardness penetration when oil quenched. High strength, heavy duty characteristics attained throughout the section.

**AISI E 6150** Identification Color: Gold & Pink

This electric furnace chromium vanadium steel is designed to provide relatively high surface hardness while retaining strength and toughness throughout the cross section. Its capacity to withstand shock loads results in its frequent selection for parts subjected to repeated impact: arbors, mandrels, rollers, springs, clutch parts, etc. Low-distortion characteristics and good impact resistance together with moderate cost make it a popular choice for tool holders, fixtures, etc.

## RYTENSE • 4140 • 4340 • E 6150

### HOT ROLLED ROUNDS—Annealed



AISI 4140, 4340 and E 6150 are Machine Straightened

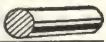
| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | | | |
|---|---|---|---|---|---|
| | | Rytense* | 4140 | 4340 | E 6150** |
| ⅜ | 0.376 | Clev. | | | |
| ½ | 0.668 | 18 | 16 | .. | 14-16 |
| ⅝ | 1.04 | 18 | 16 | .. | 14-16 |
| ¾ | 1.50 | 18 | 16 | .. | 14-16 |
| 13/16 | 1.76 | 18 | .. | .. | .... |
| ⅞ | 2.04 | 18 | 16 | .. | 14-16 |
| 15/16 | 2.35 | Bost. | .. | .. | .... |
| 1 | 2.67 | 18 | 16 | .. | 14-16 |
| 1 1/16 | 3.01 | Bost. | .. | .. | .... |
| 1 1/8 | 3.38 | 18 | 16 | .. | 14-16 |
| 1 3/16 | 3.77 | Bost. | .. | .. | .... |
| 1 ¼ | 4.17 | 18 | 16 | .. | 14-16 |
| 1 5/16 | 4.60 | Bost. | .. | .. | .... |
| 1 ⅜ | 5.05 | 18 | 16 | .. | 14-16 |
| 1 7/16 | 5.52 | N.Y. | .. | .. | .... |
| 1 ½ | 6.01 | 18 | 16 | 16 | 14-16 |
| 1 9/16 | 6.52 | Bost. | .. | .. | .... |
| 1 ⅝ | 7.05 | 18 | 16 | 16 | 14-16 |
| 1 11/16 | 7.60 | Bost. | .. | .. | .... |
| 1 ¾ | 8.18 | 18 | 16 | 16 | 14-16 |
| 1 13/16 | 8.77 | Bost. | .. | .. | .... |
| 1 ⅞ | 9.39 | 18 | 16 | 16 | 14-16 |
| 1 15/16 | 10.02 | Bost. | .. | .. | .... |
| 2 | 10.68 | 18 | 16 | 16 | 14-16 |
| 2 ⅛ | 12.06 | 18 | 16 | 16 | 14-16 |
| 2 ¼ | 13.52 | 18 | 16 | 16 | 14-16 |
| 2 ⅜ | 15.06 | 18 | 16 | 16 | 14-16 |
| 2 7/16 | 15.87 | Bost. | .. | .. | .... |
| 2 ½ | 16.69 | 18 | 16 | 16 | 14-16 |
| 2 ⅝ | 18.40 | 18 | 16 | 16 | 14-16 |
| 2 ¾ | 20.19 | 18 | 16 | 16 | 14-16 |
| 2 ⅞ | 22.07 | 20 | 16 | 16 | Bost. |
| 3 | 24.03 | 20 | 16 | 16 | 14-16 |
| 3 ⅛ | 26.08 | 20 | 16 | 16 | 14-16 |
| 3 ¼ | 28.21 | 20 | 16 | 16 | 14-16 |
| 3 ⅜ | 30.42 | 20 | 16 | 16 | 14-16 |
| 3 ½ | 32.71 | 20 | 16 | 16 | 14-16 |
| 3 ⅝ | 35.09 | 20 | 16 | 16 | .... |
| 3 ¾ | 37.55 | 20 | 16 | 16 | 14-16 |
| 3 ⅞ | 40.10 | 20 | 16 | | |

(Continued)

*Rytense is a medium carbon, manganese machinery steel (as rolled).
** In our Detroit plant or as indicated.

## RYTENSE • RYTENSE G & P ACCY. 4140 • LEADED 4140 • 4340 • E 6150

### HOT ROLLED ROUNDS—Annealed, *Continued*



| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | | | |
|---|---|---|---|---|---|
| | | Rytense* | 4140 | 4340 | E 6150** |
| 4 | 42.73 | 20 | 16 | 16 | 14-16 |
| 4 1/8 | 45.44 | 20 | 16 | .. | .... |
| 4 1/4 | 48.23 | 20 | 16 | 16 | 14-16 |
| 4 3/8 | 51.11 | Cinc. | .. | .. | .... |
| 4 1/2 | 54.08 | 20 | 16 | 16 | 14-16 |
| 4 5/8 | 57.12 | 20 | .. | .. | .... |
| 4 3/4 | 60.25 | 20 | 16 | 16 | 14-16 |
| 4 7/8 | 63.46 | Bost. | .. | .. | .... |
| 5 | 66.76 | 20 | 16 | 16 | 14-16 |
| 5 1/4 | 73.60 | 20 | 16 | 16 | 14-16 |
| 5 1/2 | 80.78 | 20 | 16 | 16 | 14-16 |
| 5 5/8 | 84.49 | Bost. | | | |
| 5 3/4 | 88.29 | 20 | 16 | 16 | 14-16 |
| 6 | 96.13 | 20 | 16 | 16 | 14-16 |
| 6 1/4 | 104.31 | 20 | 16 | 16 | 14-16 |
| 6 1/2 | 112.82 | 20 | 16 | 16 | 14-16 |
| 6 3/4 | 121.67 | 20 | 16 | .. | 14-16 |
| 7 | 130.85 | 20 | 16 | 16 | 14-16 |
| 7 1/4 | 140.36 | 20 | 16 | .. | .... |
| 7 1/2 | 150.21 | 20 | 16 | 16 | .... |
| 7 3/4 | 160.39 | 20 | 16 | .. | .... |
| 8 | 170.90 | 20 | 16 | 16 | 14-16 |
| 8 1/4 | 181.75 | Bost. | .. | .. | .... |
| 8 1/2 | 192.93 | Bost. | 16 | .. | .... |
| 9 | 216.30 | Bost. | 16 | | |
| 9 1/2 | 241.00 | Bost. | 16 | .. | .... |
| 10 | 267.00 | | 10-12† | | |

* Rytense is a medium carbon, manganese machinery steel (as rolled).
** In our Detroit plant or as indicated. † This size is smooth forged to size.

### COLD FINISHED ROUNDS—Annealed

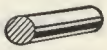
| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | | | |
|---|---|---|---|---|---|
| | | Rytense* | 4140 | Leaded 4140 | Rytense† G & P Accy. |
| 3/16 | 0.094 | | | | 10-12 |
| 1/4 | 0.167 | 10-12 | 10-12 | 10-12 | 10-12 |
| 5/16 | 0.261 | 10-12 | 10-12 | 10-12 | 10-12 |
| 3/8 | 0.376 | 10-12 | 10-12 | 10-12 | 10-12 |
| 7/16 | 0.511 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1/2 | 0.668 | 10-12 | 10-12 | 10-12 | 10-12 |
| 9/16 | 0.845 | 10-12 | 10-12 | 10-12 | .... |
| 5/8 | 1.04 | 10-12 | 10-12 | 10-12 | 10-12 |
| 11/16 | 1.26 | Clev. | 10-12 | 10-12 | 10-12 |
| 3/4 | 1.50 | 10-12 | 10-12 | 10-12 | 10-12 |

(*Continued*)

* Rytense is a medium carbon, manganese machinery steel—not annealed.
†Ground & Polished Accuracy is exact size or not more than .0005"+ or —

## RYTENSE • RYTENSE G & P ACCY. 4140 • LEADED 4140

**COLD FINISHED ROUNDS—Annealed, *Continued***



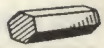
| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | | | |
|---|---|---|---|---|---|
| | | Rytense* | 4140 | Leaded 4140 | Rytense† G & P Accy. |
| 13/16 | 1.76 | Clev. | 10-12 | 10-12 | .... |
| 7/8 | 2.04 | 10-12 | 10-12 | 10-12 | 10-12 |
| 15/16 | 2.35 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 | 2.67 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 1/16 | 3.01 | Clev. | 10-12 | 10-12 | 10-12 |
| 1 1/8 | 3.38 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 3/16 | 3.77 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 1/4 | 4.17 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 5/16 | 4.60 | 10-12 | 10-12 | 10-12 | 12†† |
| 1 3/8 | 5.05 | 10-12 | 10-12 | 10-12 | 12†† |
| 1 7/16 | 5.52 | 10-12 | 10-12 | 10-12 | 12†† |
| 1 1/2 | 6.01 | 10-12 | 10-12 | 10-12 | 12†† |
| 1 9/16 | 6.52 | 10-12 | 10-12 | 10-12 | 12†† |
| 1 5/8 | 7.05 | 10-12 | 10-12 | 10-12 | 12†† |
| 1 11/16 | 7.60 | 10-12 | .... | 10-12 | 12†† |
| 1 3/4 | 8.18 | 10-12 | 10-12 | 10-12 | 12†† |
| 1 13/16 | 8.77 | .... | .... | .... | 12†† |
| 1 7/8 | 9.39 | 10-12 | 10-12 | 10-12 | 12†† |
| 1 15/16 | 10.02 | 10-12 | 10-12 | 10-12 | 12†† |
| 2 | 10.68 | 10-12 | 10-12 | 10-12 | 12†† |
| 2 1/16 | 11.36 | .... | .... | .... | .... |
| 2 1/8 | 12.06 | 10-12 | 10-12 | 10-12 | .... |
| 2 1/4 | 13.52 | 10-12 | 10-12 | 10-12 | .... |
| 2 3/8 | 15.06 | 10-12 | 10-12 | 10-12 | .... |
| 2 7/16 | 15.87 | Buff. | 10-12 | 10-12 | .... |
| 2 1/2 | 16.69 | 10-12 | 10-12 | 10-12 | .... |
| 2 5/8 | 18.40 | Cinc. | 10-12 | 10-12 | .... |
| 2 11/16 | 19.29 | Buff. | .... | .... | .... |
| 2 3/4 | 20.19 | Cinc. | 10-12 | 10-12 | .... |
| 2 7/8 | 22.07 | Cinc. | 10-12 | 10-12 | .... |
| 2 15/16 | 23.04 | 10-12 | .... | .... | .... |
| 3 | 24.03 | 10-12 | 10-12 | 10-12 | .... |
| 3 1/8 | 26.08 | 10-12 | .... | .... | .... |
| 3 1/4 | 28.21 | 10-12 | 10-12 | 10-12 | .... |
| 3 1/2 | 32.71 | 10-12 | 10-12 | 10-12 | .... |
| 3 3/4 | 37.55 | 10-12 | 10-12 | 10-12 | .... |
| 3 15/16 | 41.40 | 10-12 | .... | .... | .... |
| 4 | 42.73 | 10-12 | 10-12 | 10-12 | .... |
| 4 1/4 | 48.23 | .... | 10-12 | 10-12 | .... |
| 4 1/2 | 54.08 | .... | 10-12 | 10-12 | .... |
| 4 3/4 | 60.25 | .... | 10-12 | .... | .... |
| 5 | 66.76 | .... | 10-12 | .... | .... |

* Rytense is a medium carbon, manganese machinery steel—not annealed.
† Ground & Polished Accuracy is exact size or not more than .0005" + or —.
†† These sizes are Turned, Ground & Polished to exact size or not more than .002" under.

**FLAT DIE FORGINGS**—We furnish alloy forgings, smooth forged or rough turned in rounds, squares, hexagons, flats, and special shapes in practically any analysis.

## RYCASE·RYTENSE • 4140

### COLD DRAWN HEXAGONS—Annealed



4140 is Machine Straightened *More alloy hexagons on page 111*

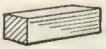
| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | | |
|---|---|---|---|---|
| | | Rycase* | Rytense** | 4140 |
| 7/16 | 0.564 | 10-12 | 10-12 | 10-12 |
| 1/2 | 0.736 | 10-12 | 10-12 | 10-12 |
| 9/16 | 0.932 | 10-12 | 10-12 | 10-12 |
| 5/8 | 1.15 | 10-12 | 10-12 | 10-12 |
| 3/4 | 1.66 | 10-12 | 10-12 | 10-12 |
| 13/16 | 1.94 | .... | 10-12 | 10-12 |
| 7/8 | 2.25 | 10-12 | 10-12 | 10-12 |
| 15/16 | 2.59 | Phil. | 10-12 | 10-12 |
| 1 | 2.94 | 10-12 | 10-12 | 10-12 |
| 1 1/16 | 3.32 | Buff. | .... | 10-12 |
| 1 1/8 | 3.73 | 10-12 | 10-12 | 10-12 |
| 1 3/16 | 4.15 | Buff. | .... | Clev. |
| 1 1/4 | 4.60 | 10-12 | 10-12 | 10-12 |
| 1 5/16 | 5.07 | Buff. | .... | N.Y. |
| 1 3/8 | 5.57 | 10-12 | 10-12 | 10-12 |
| 1 7/16 | 6.09 | Buff. | 10-12 | 10-12 |
| 1 1/2 | 6.63 | 10-12 | 10-12 | 10-12 |
| 1 5/8 | 7.78 | 10-12 | 10-12 | 10-12 |
| 1 3/4 | 9.02 | 10-12 | 10-12 | 10-12 |
| 1 13/16 | 9.67 | Buff. | .... | Buff. |
| 1 7/8 | 10.36 | Buff. | 10-12 | 10-12 |
| 2 | 11.78 | 10-12 | 10-12 | 10-12 |
| 2 1/16 | 12.53 | 10-12 | .... | .... |
| 2 1/8 | 13.30 | 10-12 | .... | .... |
| 2 3/16 | 14.09 | 10-12 | .... | .... |
| 2 1/4 | 14.91 | 10-12 | .... | 10-12 |
| 2 3/8 | 16.61 | 10-12 | .... | N.Y. |
| 2 1/2 | 18.40 | 10-12 | .... | 10-12 |
| 2 5/8 | 20.29 | 10-12 | .... | .... |
| 2 3/4 | 22.73 | 10-12 | .... | .... |
| 2 7/8 | 24.34 | 10-12 | .... | .... |
| 3 | 26.50 | 10-12 | .... | 10-12 |
| 3 1/8 | 28.76 | 10-12 | .... | .... |
| 3 1/4 | 31.10 | N.Y. | .... | .... |
| 3 1/2 | 36.07 | N.Y. | .... | .... |
| 4 | 47.11 | N.Y. | .... | .... |

* Rycase is a case hardening, low carbon, manganese machinery steel—not annealed. ** Rytense is a medium carbon, manganese machinery steel—not annealed. Stocked in our Cleveland plant.

**Manganal Steel Plate** is an 11 to 13½% Manganese-Nickel steel. This special analysis attains a high surface hardness by work hardening while in use and yet retains good ductility. Its excellent resistance to wear and abrasion make it suitable for use in gravel and stone chutes, conveyors, crusher liners, shot blasting cabinets, wear plates, etc. Manganal is available in ¼" to 1" plate and other shapes. Call us for more information or write for our descriptive bulletin giving further details including suggestions for fabrication.

## E 6150 • 4140

**SQUARES—Annealed** Machine Straightened



| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet: Hot Rolled E 6150† | Stock Lengths in Feet: Cold Drawn 4140 |
|---|---|---|---|
| ¼ | 0.212 | .... | 10-12 |
| ⅜ | 0.478 | .... | 10-12 |
| 7/16 | 0.651 | .... | 10-12 |
| ½ | 0.850 | 14-16 | 10-12 |
| 9/16 | 1.08 | .... | 10-12 |
| ⅝ | 1.33 | 14-16 | 10-12 |
| 11/16 | 1.61 | .... | 10-12 |
| ¾ | 1.91 | 14-16 | 10-12 |
| ⅞ | 2.60 | .... | 10-12 |
| 1 | 3.40 | 14-16 | 10-12 |
| 1⅛ | 4.30 | .... | 10-12 |
| 1¼ | 5.31 | 14-16 | 10-12 |
| 1⅜ | 6.43 | .... | 10-12 |
| 1½ | 7.65 | 14-16 | 10-12 |
| 1¾ | 10.41 | 14-16 | 10-12 |
| 2 | 13.60 | 14-16 | 10-12 |
| 2½ | 21.25 | 14-16 | .... |
| 3 | 30.60 | 14-16 | .... |
| 3½ | 41.65 | 14-16 | .... |
| 4 | 54.40 | 14-16 | .... |

† In our Detroit plant. *For more alloy steel squares refer to page 111.*

**HOT ROLLED FLATS—Annealed**
Machine Straightened • In our Detroit plant

| Size in Inches | Wt. per Ft. in Lbs. | Lgths., Ft. E 6150 |
|---|---|---|
| ½x1 | 1.70 | 14-16 |
| 1¼ | 2.13 | 14-16 |
| 1½ | 2.55 | 14-16 |
| 2 | 3.40 | 14-16 |
| 2½ | 4.25 | 14-16 |
| 3 | 5.10 | 14-16 |
| ⅝x1 | 2.13 | 14-16 |
| 1¼ | 2.66 | 14-16 |
| 1½ | 3.19 | 14-16 |
| 2 | 4.25 | 14-16 |
| ¾x1 | 2.55 | 14-16 |
| 1¼ | 3.19 | 14-16 |
| 1½ | 3.83 | 14-16 |
| 2 | 5.10 | 14-16 |
| 2¼ | 5.74 | 14-16 |
| 2½ | 6.38 | 14-16 |
| 3 | 7.65 | 14-16 |
| 4 | 10.20 | 14-16 |
| 1 x1¼ | 4.25 | 14-16 |
| 1½ | 5.10 | 14-16 |
| 2 | 6.80 | 14-16 |
| 2½ | 8.50 | 14-16 |
| 3 | 10.20 | 14-16 |
| 3½ | 11.90 | 14-16 |
| 4 | 13.60 | 14-16 |
| 5 | 17.00 | 14-16 |
| 6 | 20.40 | 14-16 |
| 1¼x1½ | 6.38 | 14-16 |
| 2 | 8.50 | 14-16 |
| 2½ | 10.63 | 14-16 |
| 3 | 12.75 | 14-16 |
| 3½ | 14.88 | 14-16 |
| 4 | 17.00 | 14-16 |
| 5 | 21.25 | 14-16 |
| 6 | 25.50 | 14-16 |
| 1½x2 | 10.20 | 14-16 |
| 2½ | 12.75 | 14-16 |
| 3 | 15.30 | 14-16 |
| 3½ | 17.85 | 14-16 |
| 4 | 20.40 | 14-16 |
| 5 | 25.50 | 14-16 |
| 6 | 30.60 | 14-16 |
| 1¾x2½ | 14.88 | 14-16 |
| 3 | 17.85 | 14-16 |
| 2 x2½ | 17.00 | 14-16 |
| 3 | 20.40 | 14-16 |
| 4 | 27.20 | 14-16 |
| 5 | 34.00 | 14-16 |
| 6 | 40.80 | 14-16 |
| 2½x3 | 25.50 | 14-16 |
| 3½ | 29.75 | 14-16 |
| 4 | 34.00 | 14-16 |
| 5 | 42.50 | 14-16 |
| 3 x4 | 40.80 | 14-16 |
| 5 | 51.00 | 14-16 |
| 6 | 61.20 | 14-16 |

## GUIDE TO SELECTION

The Rycut Series of free machining alloys gives you all the benefits of the latest developments in alloy steels—and offers a wide range of analyses and conditions from which to select a steel specially designed for your application.

To aid in selection, each steel is numbered to indicate typical carbon content. Rycut 20 is for case hardening applications requiring high surface hardness and a ductile core. Rycut 40 and New Rycut 50 Annealed are direct hardening steels which develop excellent mechanical properties when heat treated by conventional oil quench and temper methods. Direct hardening steels are also available in the heat treated condition.

The Rycut steels are recommended because of their outstanding advantages—faster machining, longer tool life, improved finish, increased output and reliable performance. These advantages result in lower unit costs and greater profits for you. In addition the Ryerson Certified Alloy Plan assures dependable results in shipment after shipment.

**RYCUT 20** Identification Color: Purple & Green

A low carbon Chromium Nickel Molybdenum oil hardening alloy widely used for gears, cams, etc. It develops a uniformly hard case supported by a tough core and has relatively low distortion in heat treatment—a result of carefully balanced analysis. The addition of lead increases machinability as much as 50% and tool life as much as 300% over similar but nonleaded analyses. Recommended machining feeds and speeds are similar to those used for C 1117. Typical uses are gears, cams, spindles, shafts, bushings.

**RYCUT 40 Annealed** Identification Color: Purple & Yellow

A medium carbon Chromium Molybdenum leaded alloy with free machining qualities and dependable performance. By varying heat treatment, Rycut 40 attains a wide range of strength and toughness, developing mechanical properties for diversified requirements. This oil hardening steel responds to heat treating methods used for medium carbon alloys and can be flame or induction hardened. Cutting speeds and feeds are similar to those for C 1117. Enthusiastic users report an increase in tool life up to 300% as well as marked improvement in finish. Used for applications requiring high strength and toughness—in oil field equipment, machine tool and mining industries, etc. Also for gears, set screws, axles, spindles, adapters, sleeves, nuts, shafts, screw machine products, etc.

**RYCUT 40 Heat Treated** Ident. Color: Purple, Yellow Dot

This is the same analysis as Rycut 40 Annealed, offering the additional advantages of a heat treated, ready-to-machine bar—including elimination of rough machining before heat treatment and double handling and scheduling involved in heat treating. And the desired properties for a finished part are in the bar when received from Ryerson stock. Outstanding features include exceptional machinability, tool life and finish. Guaranteed minimum mechanical properties are your assurance of top quality performance. Used for many of the same type applications as Rycut 40 Anld.

MINIMUM MECHANICAL PROPERTIES—RYCUT 40 H.T.

| Sizes | Tensile Strength psi | *Yield Point psi | % Elong. in 2" | % Red. of Area | Approx. Brinell Hardness |
|---|---|---|---|---|---|
| 2½" and under | 125,000 | 105,000 | 16 | 50 | 269/321 |
| Over 2½" to 4" | 115,000 | 95,000 | 16 | 50 | 255/321 |
| Over 4" Rd. | 110,000 | 85,000 | 16 | 45 | 241/321 |

*Yield point determined by "Dividers Method" of A.S.T.M. Spec. E8-54T.

## SELECTION, *Continued*

**NEW RYCUT 50 Annealed** Identification Color: Purple & Pink

A medium carbon, Chrome Molybdenum leaded alloy. New Rycut 50, developed by Ryerson, fills the need for a direct hardening steel with almost universal application. It heat treats to an exceptional range of strength and toughness by conventional oil quench and temper methods, and thus is well suited for an unusually broad group of applications. When increased wear resistance is required on localized areas, New Rycut 50 can be flame or induction hardened to a surface hardness of Rockwell C60-64.

New Rycut 50 is well suited to intricate machining. Machinability is rated at 85% of B 1112 and tool life is increased. Used in the production and repair of machine tools and heavy equipment, including spindles, pinions, collets, brake dies, roller chain links and pins, gears, boring bars, tool posts and holders, etc.

**NEW RYCUT 50 Heat Treated** Ident. Color: Purple, Pink Dot

The same analysis as New Rycut 50 Annealed, this steel is heat treated, machine straightened and stress relieved. Unusually high strength is your assurance of longer life and more satisfactory results under extended service. It is ready to use when received. When you specify and use this steel, you eliminate additional costs and time-loss due to machining before heat treatment, and extra handling and scheduling in heat treating. It is more readily machined than other heat treated alloys, and gives longer tool life and better finish.

Guaranteed *minimum* mechanical properties, shown below, assure long service. Its many advantages are apparent when used for maintenance requirements as well as quantity production. Applications include spindles, collets, conveyor pins, gears, boring bars, machine tools, mining tools, etc.

MINIMUM MECHANICAL PROPERTIES—NEW RYCUT 50 H. T.

| Size in Inches | Tensile Strength psi | *Yield Point psi | % Elong. in 2" | % Red. of Area | Approx. Brinell Hardness |
|---|---|---|---|---|---|
| 2½ & under | 140,000 | 120,000 | 15 | 50 | 297/341 |
| Over 2½ to 4 | 135,000 | 110,000 | 15 | 45 | 277/341 |
| Over 4 to 6 | 125,000 | 100,000 | 15 | 40 | 269/341 |
| Over 6 to 8 | 120,000 | 95,000 | 15 | 40 | 255/341 |
| Over 8 to 9½, incl. | 115,000 | 85,000 | 15 | 40 | 255/341 |

*Yield Point determined by "Dividers Method" of A.S.T.M. Spec. E8-54T.

**RYCUT 50 Annealed** Ident. Color: Purple, Pink, Black Dot
**Heat Treated** Ident. Color: Purple, Black, Pink Dot

Rycut 50 is widely used for applications such as brake dies, requiring a .50 carbon alloy. This fine grain medium carbon alloy has excellent machinability. The bars are heat treated, machine straightened and stress relieved. Also available in the annealed condition, which responds to conventional oil hardening practices and can be flame or induction hardened to a surface hardness of Rockwell C60-64. Minimum mechanical properties—same as New Rycut 50 H.T.

## RYCUT 20 • RYCUT 40 • NEW RYCUT 50

**HOT ROLLED ROUNDS** (Machine Straightened)

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | | | |
|---|---|---|---|---|---|
| | | | Annealed | Heat Treated, Stress Rel'd | |
| | | Rycut 20 | New Rycut 50 | Rycut 40† | New Rycut 50* |
| ⅝ | 1.04 | .. | .. | Buff. | .. |
| ¾ | 1.50 | .. | .. | Buff. | 20 |
| ⅞ | 2.04 | .. | 16 | Buff. | 20 |
| 1 | 2.67 | .. | 16 | 18-20 | 20 |
| 1⅛ | 3.38 | .. | 16 | 18-20 | 20 |
| 1¼ | 4.17 | .. | 16 | 18-20 | 20 |
| 1⅜ | 5.05 | .. | 16 | 18-20 | 20 |
| 1½ | 6.01 | .. | 16 | 18-20 | 20 |
| 1⅝ | 7.05 | .. | 16 | 18-20 | 20 |
| 1¾ | 8.18 | .. | 16 | 18-20 | 20 |
| 1⅞ | 9.39 | .. | 16 | 18-20 | 20 |
| 2 | 10.68 | .. | 16 | 18-20 | 20 |
| 2⅛ | 12.06 | .. | 16 | 18-20 | 20 |
| 2¼ | 13.52 | .. | 16 | 18-20 | 20 |
| 2⅜ | 15.06 | .. | 16 | 18-20 | 20 |
| 2½ | 16.69 | .. | 16 | 18-20 | 20 |
| 2⅝ | 18.40 | .. | 16 | 18-20 | 20 |
| 2¾ | 20.19 | .. | 16 | 18-20 | 20 |
| 2⅞ | 22.07 | .. | 16 | Buff. | 20 |
| 3 | 24.03 | .. | 16 | 18-20 | 20 |
| 3⅛ | 26.08 | .. | 16 | Buff. | 20 |
| 3¼ | 28.21 | 16 | 16 | 18-20 | 20 |
| 3⅜ | 30.42 | .. | .. | .... | 20 |
| 3½ | 32.71 | 16 | 16 | 18-20 | 20 |
| 3⅝ | 35.09 | .. | 16 | Buff. | 20 |
| 3¾ | 37.55 | 16 | 16 | 18-20 | 20 |
| 3⅞ | 40.10 | .. | .. | .... | 20 |
| 4 | 42.73 | 16 | 16 | 18-20 | 20 |
| 4⅛ | 45.44 | .. | .. | .... | 20 |
| 4¼ | 48.23 | 16 | 16 | 18-20 | 20 |
| 4⅜ | 51.11 | .. | .. | .... | 20 |
| 4½ | 54.08 | 16 | 16 | 18-20 | 20 |
| 4⅝ | 57.12 | .. | .. | .... | 20 |
| 4¾ | 60.25 | .. | 16 | Buff. | 20 |
| 4⅞ | 63.46 | .. | .. | .... | 20 |
| 5 | 66.76 | 16 | 16 | Buff. | 20 |
| 5¼ | 73.60 | .. | 16 | Buff. | 20 |
| 5⅜ | 77.15 | .. | .. | .... | 20 |
| 5½ | 80.78 | 16 | 16 | .... | 20 |
| 5¾ | 88.29 | .. | 16 | .... | 20 |
| 6 | 96.13 | 16 | 16 | .... | 20 |
| 6¼ | 104.31 | .. | 16 | .... | 20 |
| 6½ | 112.82 | .. | 16 | .... | 20 |
| 6¾ | 121.67 | .. | 18-20 | .... | 20 |
| 7 | 130.85 | .. | 16 | .... | 20 |
| 7¼ | 140.36 | .. | 18-20 | .... | 20 |
| 7½ | 150.21 | .. | 16 | .... | 20 |
| 7¾ | 160.39 | .. | 18-20 | .... | 20 |
| 8 | 170.90 | .. | 16 | .... | 20 |
| 8¼ | 181.75 | .. | 16 | .... | 20 |
| 8½ | 192.93 | .. | 16 | .... | 20 |
| 8¾ | 204.45 | .. | Bost. | .... | .. |
| 9 | 216.30 | .. | 16 | .... | 20 |
| 9¼ | 228.50 | .. | Bost. | .... | .. |
| 9½ | 241.00 | .. | 16 | .... | 20 |

† In our St. Louis plant or as indicated. *Larger rounds on next page.

## RYCUT 20 • RYCUT 40 • NEW RYCUT 50

### COLD FINISHED ROUNDS

Sizes 2 15/16" and larger a re Turned & Polished

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | | | |
|---|---|---|---|---|---|
| | | | Annealed | | Heat Treated Stress Relieved |
| | | Rycut 20 | Rycut 40 | New Rycut 50 | Rycut 40 |
| 1/4 | 0.167 | .... | 10-12 | .... | 10-12 |
| 5/16 | 0.261 | .... | 10-12 | .... | .... |
| 3/8 | 0.376 | .... | 10-12 | .... | 10-12 |
| 7/16 | 0.511 | .... | 10-12 | .... | 10-12 |
| 1/2 | 0.668 | 10-12 | 10-12 | 10-12 | 10-12 |
| 9/16 | 0.845 | .... | 10-12 | 10-12 | 10-12 |
| 5/8 | 1.04 | 10-12 | 10-12 | 10-12 | 10-12 |
| 11/16 | 1.26 | 10-12 | 10-12 | 10-12 | .... |
| 3/4 | 1.50 | 10-12 | 10-12 | 10-12 | 10-12 |
| 13/16 | 1.76 | 10-12 | 10-12 | 10-12 | 10-12 |
| 7/8 | 2.04 | 10-12 | 10-12 | 10-12 | 10-12 |
| 15/16 | 2.35 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 | 2.67 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 1/16 | 3.01 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 1/8 | 3.38 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 3/16 | 3.77 | 10-12 | 10-12 | 10-12 | .... |
| 1 1/4 | 4.17 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 5/16 | 4.60 | 10-12 | 10-12 | 10-12 | .... |
| 1 3/8 | 5.05 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 7/16 | 5.52 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 1/2 | 6.01 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 9/16 | 6.52 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 5/8 | 7.05 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 11/16 | 7.60 | .... | 10-12 | .... | 18-20 |
| 1 3/4 | 8.18 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 7/8 | 9.39 | 10-12 | 10-12 | 10-12 | 10-12 |
| 1 15/16 | 10.02 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 | 10.68 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 1/16 | 11.36 | .... | .... | .... | .... |
| 2 1/8 | 12.06 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 1/4 | 13.52 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 3/8 | 15.06 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 7/16 | 15.87 | .... | 10-12 | .... | 18-20 |
| 2 1/2 | 16.69 | 10-12 | 10-12 | 10-12 | 10-12 |
| 2 5/8 | 18.40 | 10-12 | 10-12 | .... | .... |
| 2 3/4 | 20.19 | 10-12 | 10-12 | .... | 10-12 |
| 2 7/8 | 22.07 | 10-12 | 10-12 | .... | .... |
| 2 15/16 | 23.04 | .... | .... | .... | 10-12 |
| 3 | 24.03 | 10-12 | 10-12 | .... | 10-12 |
| 3 1/4 | 28.21 | .... | 10-12 | .... | 18-20 |
| 3 7/16 | 31.55 | .... | .... | .... | 18-20 |
| 3 1/2 | 32.71 | .... | 10-12 | .... | 18-20 |
| 3 3/4 | 37.55 | .... | 10-12 | .... | .... |
| 3 15/16 | 41.40 | .... | .... | .... | 18-20 |
| 4 | 42.73 | .... | 10-12 | .... | 18-20 |
| 4 1/4 | 48.23 | .... | 10-12 | .... | .... |
| 4 1/2 | 54.08 | .... | 10-12 | .... | .... |

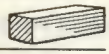
### FORGED and ROUGH TURNED ROUNDS—NEW RYCUT 50

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | |
|---|---|---|---|
| | | Annealed | H.T., Stress Rel'd. |
| 9 3/4 | 253.90 | Bost. | Bost. |
| 10 | 267.00 | 10-12* | 10-12* |
| 10 1/4 | 280.60 | Bost. | Bost. |
| 10 1/2 | 294.40 | .... | Bost. |
| 11 | 323.10 | Bost. | Bost. |
| 11 1/2 | 353.10 | .... | Bost. |
| 12 | 384.53 | Bost. | Bost. |

* Smooth Forged.

## RYCUT 50

### HOT ROLLED SQUARES—Annealed



| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Ft. | Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Ft. |
|---|---|---|---|---|---|
| 1 | 3.40 | 20 | 2½ | 21.25 | Phil. |
| 1½ | 7.65 | 16 | 2¾ | 25.71 | 16 |
| 1¾ | 10.41 | 16 | 3 | 30.60 | 16 |
| 2 | 13.60 | 16 | 3½ | 41.65 | 16 |
| 2¼ | 17.21 | 16 | 4 | 54.40 | 16 |

### HOT ROLLED FLATS—Annealed

| Size in Inches | Wt. per Ft. in Lbs. | Lengths | Size in Inches | Wt. per Ft. in Lbs. | Lengths |
|---|---|---|---|---|---|
| ¼x1 | 0.850 | 16 | 1¼x1½ | 6.38 | 16 |
| 1½ | 1.28 | 16 | 2 | 8.50 | 16 |
| 2 | 1.70 | 16 | 2½ | 10.63 | 16 |
| 2½ | 2.13 | 16 | 3 | 12.75 | 16 |
| 3 | 2.55 | 16 | 4 | 17.00 | 16 |
| ⅜x ¾ | 0.956 | 16 | 5 | 21.25 | 16 |
| 1 | 1.28 | 16 | 6 | 25.50 | 16 |
| 1¼ | 1.59 | 16 | 1½x2 | 10.20 | 16 |
| 1½ | 1.91 | 16 | 2½ | 12.75 | 16 |
| 2 | 2.55 | 16 | 3 | 15.30 | 16 |
| 2½ | 3.19 | 16 | 4 | 20.40 | 16 |
| 3 | 3.83 | 16 | 5 | 25.50 | 16 |
| 4 | 5.10 | 16 | 6 | 30.60 | 16 |
| ½x ¾ | 1.28 | 16 | 7 | 35.70 | 16 |
| 1 | 1.70 | 16 | 1¾x2½ | 14.88 | 16 |
| 1¼ | 2.13 | 16 | 2¾ | 16.36 | 20 |
| 1½ | 2.55 | 16 | 3 | 17.85 | 16 |
| 2 | 3.40 | 16 | 4 | 23.80 | 16 |
| 2½ | 4.25 | 16 | 5 | 29.75 | 16 |
| 3 | 5.10 | 16 | 6 | 35.70 | 16 |
| 4 | 6.80 | 16 | 7 | 41.65 | 16 |
| ⅝x1 | 2.13 | 16 | 2 x2½ | 17.00 | 16 |
| 1¼ | 2.66 | 16 | 3 | 20.40 | 16 |
| 1½ | 3.19 | 16 | 4 | 27.20 | 16 |
| 2 | 4.25 | 16 | 5 | 34.00 | 16 |
| 4 | 8.50 | 16 | 6 | 40.80 | 16 |
| ¾x1 | 2.55 | 16 | 7 | 47.60 | 16 |
| 1¼ | 3.19 | 16 | 2½x3 | 25.50 | 16 |
| 1½ | 3.83 | 16 | 4 | 34.00 | 16 |
| 2 | 5.10 | 16 | 5 | 42.50 | 16 |
| 2½ | 6.38 | 16 | 6 | 51.00 | 16 |
| 3 | 7.65 | 16 | 7 | 59.50 | 16 |
| 4 | 10.20 | 16 | 3 x4 | 40.80 | 16 |
| 1 x1½ | 5.10 | 16 | 5 | 51.00 | 16 |
| 2 | 6.80 | 16 | 6 | 61.20 | 16 |
| 2½ | 8.50 | 16 | 7 | 71.40 | 16 |
| 3 | 10.20 | 16 | *(3 x 7 has round corners)* | | |
| 4 | 13.60 | 16 | | | |

**Break Die Applications**—Rycut 50 is often used in the manufacture of Break Dies. We will promptly heat treat our stock for your Break Die needs.

## GUIDE TO SELECTION

Heat treated alloys eliminate several costly and time-consuming operations which are usually necessary when using as-rolled or annealed alloys. Savings result from elimination of machining before heat treatment, double handling and scheduling of heat treating, and delays in production schedules.

Every heat accepted for our stocks is rigidly tested to meet *minimum* mechanical properties shown. You can rely on Ryerson heat treated alloys to perform dependably. All are stress relieved to assure minimum distortion in machining.

For the *fastest machining* heat treated alloys in their carbon ranges, see Rycut series pages 102–106.

**AISI 4140 H.T.** Ident. Color: Black, Yellow Dot

**AISI 4140 H.T. T.G.& P.** Ident. Color: Black, Red, Yellow Dot

This medium carbon Chromium Molybdenum steel is heat treated to a high, commercially machinable hardness.

Guaranteed *minimum* mechanical properties listed below make this steel well-suited for applications such as heavy duty shafting and bolting materials including socket wrenches, bushings, pins, spindles, cams, gears, etc. 4140 H.T. complies with ASTM-A-193-55T, Grade B-7, for alloys used for bolting materials to withstand temperatures up to 1000° F.

MINIMUM MECHANICAL PROPERTIES—H.R. and C.F. 4140 H.T.

| Sizes | Tensile Strength psi | *Yield Point psi | % Elong. in 2" | % Red. of Area | Approx. Brinell Hardness |
|---|---|---|---|---|---|
| 2½" and under | 125,000 | 105,000 | 16 | 50 | 269/321 |
| Over 2½" to 4" | 115,000 | 95,000 | 16 | 50 | 255/321 |
| Over 4" | 110,000 | 85,000 | 16 | 45 | 248/321 |

* Yield point determined by the "Dividers Method" of Spec. A.S.T.M. E8-54T.

**LEADED AISI 4140 H.T.** Identification Color: Purple, Yellow Dot

Marked improvement in machinability over H.T. 4140, with equal versatility, distinguishes this heat treated, fine-grained Chromium Molybdenum leaded medium carbon alloy. Important per-unit savings are made possible by superior machinability plus better finish and longer tool life.

MINIMUM MECHANICAL PROPERTIES—LEADED 4140 H.T.

| Sizes | Tensile Strength psi | *Yield Point psi | % Elong. in 2" | % Red. of Area | Approx. Brinell Hardness |
|---|---|---|---|---|---|
| 2½" and under | 125,000 | 105,000 | 16 | 50 | 269/321 |
| Over 2½" to 4" | 115,000 | 95,000 | 16 | 50 | 255/321 |
| Over 4" Rd. | 110,000 | 85,000 | 16 | 45 | 248/321 |

* Yield point determined by "Dividers Method" of A.S.T.M. Spec. E8-54T.

## SELECTION, *Continued*

**RYCROME** Identification Color: Black, Yellow Dot

**RYCROME T.G.& P.** Identification Color: Black, Red, Yellow Dot

A heat treated, stress-relieved Chromium Molybdenum alloy steel closely controlled to meet rigid Ryerson specifications. The minimum mechanical properties listed below assure you of high strength and good ductility plus outstanding shock and impact resistance for highly stressed shafts and other important parts such as studs, pinions, roll mandrels and high temperature bolts.

MINIMUM MECHANICAL PROPERTIES—H.R. and C.F. RYCROME

| Sizes | Tensile Strength psi | *Yield Point psi | % Elong. in 2" | % Red. of Area | Approx. Brinell Hardness |
|---|---|---|---|---|---|
| 2½" and under | 125,000 | 105,000 | 16 | 50 | 269/321 |
| Over 2½" to 4" | 115,000 | 95,000 | 16 | 50 | 255/321 |
| Over 4" | 110,000 | 85,000 | 16 | 45 | 248/321 |

*Yield point determined by the "Dividers Method" of Spec. A.S.T.M. E8-54T.

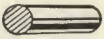
**NITRALLOY TYPE 135 MOD. H.T.** Ident. Color: Blue, Yellow Dot

This heat treated aircraft quality alloy steel is generally used for parts requiring one or more of the following advantages of a nitrided case: extreme case hardness, superior wear resistance, retention of hardness at elevated temperatures and added resistance to corrosion. Heat treated Nitralloy in Ryerson stocks is machinable and provides a strong core to support the nitrided case.

Here are some of our large stocks of Certified Quality Alloy Bars.

## 4140 • LEADED 4140 • RYCROME

**HOT ROLLED ROUNDS** (Machine Straightened)



*Stress relieved to minimize warpage during machining*

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | | |
|---|---|---|---|---|
| | | 4140 | Leaded 4140* | Rycrome |
| ½ | 0.668 | 20 | | 20 |
| ⅝ | 1.04 | 20 | Buff. | 20 |
| ¾ | 1.50 | 20 | Buff. | 20 |
| ⅞ | 2.04 | 20 | Buff. | 20 |
| 1 | 2.67 | 20 | 18-20 | 20 |
| 1⅛ | 3.38 | 20 | 18-20 | 20 |
| 1¼ | 4.17 | 20 | 18-20 | 20 |
| 1⅜ | 5.05 | 20 | 18-20 | 20 |
| 1½ | 6.01 | 20 | 18-20 | 20 |
| 1⅝ | 7.05 | 20 | 18-20 | 20 |
| 1¾ | 8.18 | 20 | 18-20 | 20 |
| 1⅞ | 9.39 | 20 | 18-20 | 20 |
| 2 | 10.68 | 20 | 18-20 | 20 |
| 2⅛ | 12.06 | 20 | 18-20 | 20 |
| 2¼ | 13.52 | 20 | 18-20 | 20 |
| 2⅜ | 15.06 | 20 | 18-20 | 20 |
| 2½ | 16.69 | 20 | 18-20 | 20 |
| 2⅝ | 18.40 | 20 | 18-20 | 20 |
| 2¾ | 20.19 | 20 | 18-20 | 20 |
| 2⅞ | 22.07 | 20 | Buff. | 20 |
| 3 | 24.03 | 20 | 18-20 | 20 |
| 3⅛ | 26.08 | 20 | Buff. | 20 |
| 3¼ | 28.21 | 20 | 18-20 | 20 |
| 3⅜ | 30.42 | 20 | | 20 |
| 3½ | 32.71 | 20 | 18-20 | 20 |
| 3⅝ | 35.09 | 20 | Buff. | 20 |
| 3¾ | 37.55 | 20 | 18-20 | 20 |
| 3⅞ | 40.10 | 20 | | 20 |
| 4 | 42.73 | 20 | 18-20 | 20 |
| 4⅛ | 45.44 | 20 | .... | 20 |
| 4¼ | 48.23 | 20 | 18-20 | 20 |
| 4½ | 54.08 | 20 | 18-20 | 20 |
| 4⅝ | 57.12 | 20 | .... | 20 |
| 4¾ | 60.25 | 20 | Buff. | 20 |
| 5 | 66.76 | 20 | Buff. | 20 |
| 5¼ | 73.60 | 20 | Buff. | 20 |
| 5½ | 80.78 | 20 | .... | 20 |
| 5¾ | 88.29 | 20 | .... | 20 |
| 6 | 96.13 | 20 | | 20 |

*In our St. Louis plant or as indicated.

## 4140 • 4140 TG&P • LEADED 4140 RYCROME • RYCROME TG&P

### COLD FINISHED ROUNDS

*Stress relieved to minimize warpage during machining*

Sizes 2 15/16" and larger are Turned & Polished

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | | | | |
|---|---|---|---|---|---|---|
| | | 4140 | 4140* TG&P | Leaded 4140 | Rycrome | Rycrome* TG&P |
| 1/4 | 0.167 | 10-12 | .... | 10-12 | 10-12 | .... |
| 3/8 | 0.376 | 10-12 | .... | 10-12 | 10-12 | .... |
| 7/16 | 0.511 | 10-12 | .... | 10-12 | 10-12 | .... |
| 1/2 | 0.668 | 10-12 | .... | 10-12 | 10-12 | .... |
| 9/16 | 0.845 | 10-12 | .... | 10-12 | 10-12 | .... |
| 5/8 | 1.04 | 10-12 | .... | 10-12 | 10-12 | .... |
| 11/16 | 1.26 | 10-12 | .... | .... | 10-12 | .... |
| 3/4 | 1.50 | 10-12 | .... | 10-12 | 10-12 | .... |
| 13/16 | 1.76 | 10-12 | .... | 10-12 | 10-12 | .... |
| 7/8 | 2.04 | 10-12 | .... | 10-12 | 10-12 | .... |
| 15/16 | 2.35 | 10-12 | .... | 10-12 | 10-12 | .... |
| 1 | 2.67 | 10-12 | 18-20 | 10-12 | 10-12 | 18-20 |
| 1 1/16 | 3.01 | 10-12 | 18-20 | 10-12 | 10-12 | 18-20 |
| 1 1/8 | 3.38 | 10-12 | 18-20 | 10-12 | 10-12 | 18-20 |
| 1 3/16 | 3.77 | 10-12 | 18-20 | .... | 10-12 | 18-20 |
| 1 1/4 | 4.17 | 10-12 | 18-20 | 10-12 | 10-12 | 18-20 |
| 1 5/16 | 4.60 | Bost. | 18-20 | .... | Bost. | 18-20 |
| 1 3/8 | 5.05 | 10-12 | 18-20 | 10-12 | 10-12 | 18-20 |
| 1 7/16 | 5.52 | 10-12 | 18-20 | 10-12 | 10-12 | 18-20 |
| 1 1/2 | 6.01 | 10-12 | 18-20 | 10-12 | 10-12 | 18-20 |
| 1 9/16 | 6.52 | 10-12 | 18-20 | 10-12 | 10-12 | 18-20 |
| 1 5/8 | 7.05 | 10-12 | 18-20 | 10-12 | 10-12 | 18-20 |
| 1 11/16 | 7.60 | Buff. | 18-20 | St.L. | Buff. | 18-20 |
| 1 3/4 | 8.18 | 10-12 | 18-20 | 10-12 | 10-12 | 18-20 |
| 1 7/8 | 9.39 | 10-12 | 18-20 | 10-12 | 10-12 | 18-20 |
| 1 15/16 | 10.02 | 10-12 | 18-20 | 10-12 | 10-12 | 18-20 |
| 2 | 10.68 | 10-12 | 18-20 | 10-12 | 10-12 | 18-20 |
| 2 1/8 | 12.06 | 10-12 | .... | 10-12 | 10-12 | .... |
| 2 1/4 | 13.52 | 10-12 | 18-20 | 10-12 | 10-12 | 18-20 |
| 2 3/8 | 15.06 | 10-12 | 18-20 | 10-12 | 10-12 | 18-20 |
| 2 7/16 | 15.87 | .... | 18-20 | St.L. | .... | 18-20 |
| 2 1/2 | 16.69 | 10-12 | 18-20 | 10-12 | 10-12 | 18-20 |
| 2 5/8 | 18.40 | 10-12 | .... | .... | 10-12 | .... |
| 2 3/4 | 20.19 | 10-12 | 18-20 | 10-12 | 10-12 | 18-20 |
| 2 7/8 | 22.07 | Pgh. | .... | Buff. | Pgh. | .... |
| 2 15/16 | 23.04 | 10-12 | 18-20 | 10-12 | 10-12 | 18-20 |
| 3 | 24.03 | 10-12 | 18-20 | 10-12 | 10-12 | 18-20 |
| 3 1/8 | 26.08 | 10-12 | .... | .... | 10-12 | .... |
| 3 1/4 | 28.21 | 10-12 | 18-20 | St.L. | 10-12 | 18-20 |
| 3 7/16 | 31.55 | 10-12 | 18-20 | St.L. | 10-12 | 18-20 |
| 3 1/2 | 32.71 | 10-12 | 18-20 | St.L. | 10-12 | 18-20 |
| 3 3/4 | 37.55 | 10-12 | .... | .... | 10-12 | .... |
| 3 15/16 | 41.40 | 10-12 | 18-20 | St.L. | 10-12 | 18-20 |
| 4 | 42.73 | 10-12 | 18-20 | St.L. | 10-12 | 18-20 |
| 4 1/4 | 48.23 | Pitt. | .... | .... | Pitt | .... |
| 4 1/2 | 54.08 | Pitt. | .... | .... | Pitt. | .... |
| 4 3/4 | 60.25 | Pitt. | .... | .... | Pitt. | .... |
| 5 | 66.76 | 10-12 | .... | .... | 10-12 | .... |
| 5 1/4 | 73.60 | Pitt. | .... | .... | Pitt. | .... |
| 5 1/2 | 80.78 | Pitt. | .... | .... | Pitt. | .... |
| 5 3/4 | 88.29 | Pitt. | .... | .... | Pitt. | .... |
| 6 | 96.13 | Pitt. | .... | .... | Pitt. | .... |

*In other Ryerson plants.

## 4140 • RYCROME

**HOT ROLLED SQUARES** (Machine Straightened)

*Stress relieved to minimize warpage during machining*

| Size in Inches | Wt. per Ft. in Lbs. | Stock Length in Feet | |
|---|---|---|---|
| | | 4140 | Rycrome |
| 1 | 3.40 | 20 | 20 |
| 1 1/4 | 5.31 | 20 | 20 |
| 1 1/2 | 7.65 | 20 | 20 |
| 1 3/4 | 10.41 | 20 | 20 |
| 2 | 13.60 | 20 | 20 |
| 2 1/4 | 17.21 | 20 | 20 |
| 2 1/2 | 21.25 | 20 | 20 |
| 2 3/4 | 25.71 | 20 | 20 |
| 3 | 30.60 | 20 | 20 |
| 3 1/2 | 41.65 | 20 | 20 |
| 4 | 54.40 | 20 | 20 |

**COLD FINISHED HEXAGONS**

*Stress relieved to minimize warpage during machining*

In our New York plant

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | |
|---|---|---|---|
| | | 4140 | Rycrome |
| 9/16 | 0.932 | 10-12 | 10-12 |
| 3/4 | 1.66 | 10-12 | 10-12 |
| 7/8 | 2.25 | 10-12 | 10-12 |
| 15/16 | 2.59 | 10-12 | 10-12 |
| 1 | 2.95 | 10-12 | 10-12 |
| 1 1/16 | 3.32 | 10-12 | 10-12 |
| 1 1/8 | 3.73 | 10-12 | 10-12 |
| 1 1/4 | 4.60 | 10-12 | 10-12 |
| 1 5/16 | 5.07 | 10-12 | 10-12 |
| 1 1/2 | 6.63 | 10-12 | 10-12 |
| 1 5/8 | 7.78 | 10-12 | 10-12 |
| 1 7/8 | 10.36 | 10-12 | 10-12 |
| 2 | 11.78 | 10-12 | 10-12 |
| 2 1/4 | 14.91 | 10-12 | 10-12 |
| 2 3/8 | 16.61 | 10-12 | 10-12 |
| 2 1/2 | 18.40 | 10-12 | 10-12 |
| 2 5/8 | 20.29 | 10-12 | 10-12 |
| 3 | 26.50 | 10-12 | 10-12 |

**Manganal Steel Plate** is an 11 to 13½% Manganese-Nickel steel. This special analysis attains a high surface hardness by work hardening while in use and yet retains good ductility. Its excellent resistance to wear and abrasion make it suitable for use in gravel and stone chutes, conveyors, crusher liners, shot blasting cabinets, wear plates, etc. Manganal is available in ¼″ to 1″ plate and other shapes. Call us for more information or write for our descriptive bulletin giving further details including suggestions for fabrication.

## NITRALLOY TYPE 135 MODIFIED

Identification Color: Blue with Yellow Dot

**Heat Treated—Sorbitic Structure—Machine Straightened**

*Aircraft Quality to Spec. MIL-S-6709, Comp. A and/or AMS 6470 C*

CHEMICAL ANALYSIS

| Spec. | Carb. | Mang. | Sil. | Chrom. | Alum. | Moly. |
|---|---|---|---|---|---|---|
| MIL-S-6709 | .38-.43 | .50-.70 | .20-.40 | 1.40-1.80 | .90-1.35 | .30-.40 |
| AMS 6470C | .38-.43 | .50-.70 | .20-.40 | 1.40-1.80 | .95-1.30 | .30-.40 |

MINIMUM MECHANICAL PROPERTIES

| All Sizes* | Tensile Strength psi | Yield Point psi | % Elong. in 2" | % Red. of Area | Approx. Brinell Hardness |
|---|---|---|---|---|---|
| Hot Rolled | 110,000 | 85,000 | 18 | 50 | 223/263 |
| Cold Finished† | 110,000 | 85,000 | | | 223/263 |

* Properties determined at center of rds. up to 1½", at ½ radius over 1½".
† Cold finished stock meets decarburization limits of AMS 6470 C only.

This heat treated aircraft quality alloy steel is widely preferred because of its excellent response to the Nitriding Process. It is generally used for parts requiring one or more of the following advantages of a nitrided case: extreme case hardness, superior wear resistance, retention of hardness at elevated temperatures and added resistance to corrosion.

Heat treated Nitralloy as carried in Ryerson stocks provides a strong core to support the nitrided case and is machinable.

***Other sizes and analyses supplied promptly from mill***

### HOT ROLLED ROUNDS

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet | Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet |
|---|---|---|---|---|---|
| ⅜ | 0.376 | 14-16 | 2⅞ | 22.07 | 14-16 |
| ½ | 0.668 | 14-16 | 3 | 24.03 | 14-16 |
| ⅝ | 1.04 | 14-16 | 3¼ | 28.21 | 14-16 |
| ¾ | 1.50 | 14-16 | 3½ | 32.71 | 14-16 |
| ⅞ | 2.04 | 14-16 | 3¾ | 37.55 | 14-16 |
| 1 | 2.67 | 14-16 | 4 | 42.73 | 14-16 |
| 1⅛ | 3.38 | 14-16 | 4¼ | 48.23 | 14-16 |
| 1¼ | 4.17 | 14-16 | 4½ | 54.08 | 14-16 |
| 1⅜ | 5.05 | 14-16 | 4¾ | 60.25 | 14-16 |
| 1½ | 6.01 | 14-16 | 5 | 66.76 | 14-16 |
| 1⅝ | 7.05 | 14-16 | 5¼ | 73.60 | 14-16 |
| 1¾ | 8.18 | 14-16 | 5½ | 80.78 | 14-16 |
| 1⅞ | 9.39 | 14-16 | 5¾ | 88.29 | 14-16 |
| 2 | 10.68 | 14-16 | 6 | 96.13 | 14-16 |
| 2⅛ | 12.06 | 14-16 | 6¼ | 104.31 | N.Y. |
| 2¼ | 13.52 | 14-16 | 6½ | 112.82 | N.Y. |
| 2⅜ | 15.06 | 14-16 | 6¾ | 121.67 | N.Y. |
| 2½ | 16.69 | 14-16 | 7 | 130.85 | N.Y. |
| 2⅝ | 18.40 | 14-16 | | | |

### COLD FINISHED ROUNDS

In our New York plant

| | | | | | |
|---|---|---|---|---|---|
| ⅜ | 0.376 | 10-12 | 1 5/16 | 2.35 | 10-12 |
| 7/16 | 0.511 | 10-12 | 1 | 2.67 | 10-12 |
| ½ | 0.668 | 10-12 | 1 1/16 | 3.01 | 10-12 |
| 9/16 | 0.845 | 10-12 | 1⅛ | 3.38 | 10-12 |
| ⅝ | 1.04 | 10-12 | 1¼ | 4.17 | 10-12 |
| ¾ | 1.50 | 10-12 | 1⅜ | 5.05 | 10-12 |
| ⅞ | 2.04 | 10 12 | 1½ | 6.01 | 10-12 |

## "AIRCRAFT QUALITY"

On the following pages are the many aircraft quality alloy steels ready for immediate shipment from our stocks. These large inventories have been carefully developed to conveniently serve the needs of the many producers of aircraft parts.

All material is stocked in strict accordance with the specifications so your order may be shipped without delay. Notarized affidavits can be furnished as evidence that the material conforms to the required specifications. Certifications for heat treated material include results of mechanical tests for each heat. And every shipment of annealed, as rolled, normalized and normalized and tempered alloys is accompanied by a Certificate of Analysis and Hardenability for each heat—an aid to accurate and uniform heat treatment.

The term "Aircraft Quality" as applied to steel indicates it has been tested and approved as suitable for the production of aircraft parts. Steels used in aircraft are subjected to many different types of fabrication—such as welding, hot and cold forming, machining, polishing, etc.—and then must resist many different magnitudes and types of stresses. For instance highly stressed parts such as crankshafts, connecting rods, wrist pins, valves, etc., require maximum strength and resistance to fatigue, wear and shock.

Consistently high quality of aircraft quality steel, is assured by many special precautions—including careful selection of scrap, heating, melting, refining, casting, billet conditioning, rolling and thermal treatment. All operations must be closely controlled to give a superior quality steel for such critical applications.

In general, specifications for aircraft quality steel include chemical analysis ranges which are the same as or close to the standard AISI types.

Ryerson metallurgists and engineers will be glad to furnish further information and interpretations of these specifications and help you with questions of selection, procurement and application.

### AIRCRAFT QUALITY ALLOYS IN STOCK

E 4130 (AN-QQ-S-685 & AMS 6350 C)
Strip, Sheet, Plate . . . . . 114
E 4130 (MIL-S-6758)
Rounds . . . . . 115
Hexagons, Squares, Billets . . . . . 116
Flats . . . . . 117
E 4140 (MIL-S-5626)
Rounds, Hexagons, Flats, Billets . . . . . 118
E 4340 (AMS 6415 E & MIL-S-5000)
Rounds, Billets . . . . . 119
E 8740 (AMS 6322 D & 6324 A) . . . . . 120
E 9310 (AMS-6260 E) . . . . . 120
Nitralloy 135 Mod. (MIL-S-6709 & AMS 6470 C) . 112

## 4130 STRIP, SHEET & PLATE

*AN-QQ-S-685 As Amended—AMS 6350C*

**HOT ROLLED, PICKLED & OILED**

Identification Colors

**Annealed, Pickled & Oiled (Cond. A)** Black & Blue

**Norm., Pickled & Oiled (Cond. N)** Black & Blue, White Stripe

**STRIP and SHEET**

| Thick. in Inches | Size in Inches | *Wt. per Piece in Lbs. | Normalized AN-QQ-S-685 | Annealed AN-QQ-S-685 | Annealed AMS 6350 C |
|---|---|---|---|---|---|
| .025 | 18x72 | 9.18 | Chgo. | Chgo. | |
| .032 | 18 & 36¼x72 | 11.75 | Chgo. | Chgo. | |
| .036 | 18x72 | 13.21 | Chgo. | Chgo. | |
| .040 | 18x72 | 14.69 | Chgo. | Chgo. | |
| .042 | 36¼x72 | 15.43 | Chgo. | Chgo. | |
| .050 | 18 & 36¼x72 | 18.36 | Chgo. | Chgo. | Buff. |
| .063 | 18 & 36¼x72 | 23.13 | Chgo. | Chgo. | |
| .065 | 18x72 | 23.87 | | | Buff. |
| .072 | 18 & 36¼x72 | 26.42 | Chgo. | Chgo. | |
| .078 | 18 & 36¼x72 | 28.64 | Chgo. | Chgo. | |
| .080 | 18 & 36¼x72 | 29.38 | Chgo. | Chgo. | |
| .083 | 18x72 | 30.48 | | | Buff. |
| .090 | 18 & 36¼x72 | 33.05 | Chgo. | Chgo. | |
| .094 | 18x72 | 34.52 | | | Buff. |
| .100 | 18 & 36¼x72 | 36.72 | Chgo. | Chgo. | |
| .109 | 18 & 36¼x72 | 40.02 | Chgo. | Chgo. | Buff. |
| .125 | 18 & 36¼x72 | 45.90 | Chgo. | Chgo. | Buff. |
| .156 | 18 & 36¼x72 | 57.29 | Chgo. | Chgo. | Buff. |
| .160 | 18x72 | 58.75 | Chgo. | Chgo. | |
| .187 | 18 & 36¼x72 | 68.67 | Chgo. | Chgo. | Buff. |

**PLATE**

| | | | | | |
|---|---|---|---|---|---|
| .250 | 18 & 36¼x72 | 91.80 | Chgo. | Chgo. | |
| .312 | 18 & 36¼x72 | 114.57 | Chgo. | Chgo. | |
| .375 | 18 & 36¼x72 | 137.70 | Chgo. | Chgo. | |
| .500 | 18 & 36¼x72 | 183.60 | Chgo. | Chgo. | |
| .625 | 18x72 | 231.30 | Chgo. | Chgo. | |
| .750 | 18x72 | 275.40 | Chgo. | Chgo. | |
| .875 | 18x72 | 324.90 | Chgo. | Chgo. | |
| 1.000 | 18x72 | 367.20 | Chgo. | Chgo. | |

*Weights shown are for 18x72" strip. 36¼x72" sheet will weigh approx. double

**Normalized**—MINIMUM MECHANICAL PROPERTIES

| Thickness in Inches | Tensile Strength psi | Yield Strength psi | % Elong. in 2" |
|---|---|---|---|
| .062 and under | 95,000 | 75,000 | 10.0 |
| Over .062 to .125 | 95,000 | 75,000 | 12.0 |
| Over .125 to .187 | 95,000 | 75,000 | 15.0 |
| Over .187 to .625 | 90,000 | 70,000 | 20.0 |
| .750 and over | 90,000 | 70,000 | 18.0 |

**Annealed**—MAXIMUM TENSILE STRENGTH: 85,000 psi

**Standard Permissible Variations from Specified Thickness**

Normalized and Annealed

| Thickness in Inches | Variations in Inches | Thickness in Inches | Variations in Inches |
|---|---|---|---|
| .025 to .0349 | +.003 −.003 | .375 to .500 | +.030 −.010 |
| .035 to .0539 | +.004 −.004 | .500 to .625 | +.035 −.010 |
| .054 to .0709 | +.006 −.006 | .625 to .750 | +.040 −.010 |
| .071 to .1179 | +.007 −.007 | .750 to .875 | +.045 −.010 |
| .118 to .1909 | +.008 −.008 | .875 to 1.000 | +.050 −.010 |
| .191 to .2499 | +.009 −.009 | 1.000 to 1.500 | +.065 −.010 |
| .250 to .375 | +.025 −.010 | 1.500 to 2.000 | +.075 −.010 |

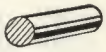
## E 4130 BARS • *MIL-S-6758*

Identification Colors

**Annealed (Cond. C)** Black & Blue
**Normalized (Cond. D)** Black & Blue with White Dot
**Norm. & Temp. (Cond. E)** Black & Blue with Orange Dot
**Heat Treated (Cond. F)** Black with Blue Dot

E 4130 Chrome Molybdenum alloy is manufactured in strict accordance with the Military Aero. Spec. These bars are Aircraft Quality and can be Magnaflux inspected after machining.

### HOT ROLLED & COLD FINISHED ROUNDS



Lengths: Hot Rolled 18-20 Ft. Cold Finished 10-12 Ft.

| Size in Inches | Wt. per Ft. in Lbs. | Hot Rolled (Surface 1) | Cold Finished (Surface 4) | | | |
|---|---|---|---|---|---|---|
| | | Norm. | Anld. | Norm. | N.&T. | Heat Tr. |
| 1/4 | 0.167 | ... | Chgo. | St.L. | Clev. | L.A. |
| 5/16 | 0.261 | ... | Chgo. | St.L. | Clev. | L.A. |
| 3/8 | 0.376 | ... | Chgo. | St.L. | Clev. | Chgo. |
| 7/16 | 0.511 | ... | Chgo. | St.L. | Clev. | Chgo. |
| 1/2 | 0.668 | ... | Chgo. | St.L. | Clev. | Chgo. |
| 9/16 | 0.845 | ... | Chgo. | St.L. | Clev. | Chgo. |
| 5/8 | 1.04 | ... | Chgo. | St.L. | Clev. | Chgo. |
| 11/16 | 1.26 | ... | Chgo. | St.L. | Clev. | ... |
| 3/4 | 1.50 | ... | Chgo. | St.L. | Clev. | Chgo. |
| 13/16 | 1.76 | ... | Chgo. | St.L. | Clev. | Chgo. |
| 7/8 | 2.04 | ... | Chgo. | St.L. | Clev. | Chgo. |
| 15/16 | 2.35 | ... | Chgo. | St.L. | Clev. | Chgo. |
| 1 | 2.67 | ... | Chgo. | St.L. | Clev. | Chgo. |
| 1 1/16 | 3.01 | ... | Chgo. | St.L. | Clev. | Chgo. |
| 1 1/8 | 3.38 | ... | Chgo. | St.L. | ... | Chgo. |
| 1 3/16 | 3.77 | ... | Chgo. | Clev. | ... | Chgo. |
| 1 1/4 | 4.17 | ... | Chgo. | St.L. | ... | Chgo. |
| 1 5/16 | 4.60 | ... | Chgo. | Clev. | ... | Chgo. |
| 1 3/8 | 5.05 | ... | Chgo. | St.L. | ... | Chgo. |
| 1 7/16 | 5.52 | ... | Chgo. | Clev. | ... | Chgo. |
| 1 1/2 | 6.01 | ... | Chgo. | St.L. | ... | Chgo. |
| 1 9/16 | 6.52 | ... | N.Y. | ... | ... | ... |
| 1 5/8 | 7.05 | L.A. | Chgo. | Clev. | ... | ... |
| 1 3/4 | 8.18 | Phil. | Chgo. | Clev. | ... | ... |
| 1 7/8 | 9.39 | Phil. | Chgo. | Clev. | ... | ... |
| 2 | 10.68 | Phil. | Chgo. | Clev. | ... | ... |
| 2 1/8 | 12.06 | L.A. | Chgo. | Clev. | ... | ... |
| 2 1/4 | 13.52 | Phil. | Chgo. | Clev. | ... | ... |
| 2 3/8 | 15.06 | L.A. | Chgo. | Clev. | ... | ... |
| 2 1/2 | 16.68 | Phil. | Chgo. | Clev. | ... | ... |
| 2 5/8 | 18.40 | L.A. | N.Y. | Clev. | ... | ... |
| 2 3/4 | 20.19 | Phil. | Chgo. | Clev. | ... | ... |
| 2 7/8 | 22.07 | L.A. | N.Y. | Clev. | ... | ... |
| 3 | 24.03 | Phil. | Chgo. | Clev. | ... | ... |
| 3 1/8 | 26.08 | Phil. | N.Y. | ... | ... | ... |
| 3 1/4 | 28.21 | L.A. | Chgo. | ... | ... | ... |
| 3 1/2 | 32.71 | Phil. | Chgo. | ... | ... | ... |
| 3 3/4 | 37.55 | L.A. | Chgo. | ... | ... | ... |
| 4 | 42.73 | Phil. | Chgo. | ... | ... | ... |
| 4 1/4 | 48.23 | L.A. | ... | ... | ... | ... |
| 4 1/2 | 54.08 | L.A. | ... | ... | ... | ... |
| 4 3/4 | 60.25 | L.A. | ... | ... | ... | ... |
| 5 | 66.76 | L.A. | ... | ... | ... | ... |
| 5 1/2 | 80.78 | L.A. | ... | ... | ... | ... |
| 6 | 96.13 | L.A. | ... | ... | ... | ... |
| 6 1/2 | 112.82 | L.A. | ... | ... | ... | ... |
| 7 | 130.85 | L.A. | ... | ... | ... | ... |

## E 4130 BARS • *MIL-S-6758* (Cont'd)

### COLD FINISHED HEXAGONS (Surface 4)

| Size in Inches | Wt. per Ft. in Lbs. | Annealed* (Cond. C) | Norm. & Temp.† (Cond. E) | Heat Treated (Cond. F) |
|---|---|---|---|---|
| ¼ | .184 | | | L.A. |
| 5/16 | .288 | .... | .... | L.A. |
| ⅜ | 0.414 | 10-12 | 10-12 | 10-12 |
| 7/16 | 0.564 | 10-12 | 10-12 | 10-12 |
| ½ | 0.736 | 10-12 | 10-12 | 10-12 |
| 9/16 | 0.932 | 10-12 | 10-12 | 10-12 |
| ⅝ | 1.15 | 10-12 | 10-12 | 10-12 |
| 11/16 | 1.39 | .... | .... | L.A. |
| ¾ | 1.66 | 10-12 | 10-12 | 10-12 |
| ⅞ | 2.25 | 10-12 | 10-12 | 10-12 |
| 15/16 | 2.59 | 10-12 | 10-12 | 10-12 |
| 1 | 2.95 | 10-12 | 10-12 | 10-12 |
| 1 1/16 | 3.32 | 10-12 | 10-12 | 10-12 |
| 1 ⅛ | 3.73 | 10-12 | 10-12 | 10-12 |
| 1 3/16 | 4.15 | .... | .... | L.A. |
| 1 ¼ | 4.60 | 10-12 | 10-12 | 10-12 |
| 1 5/16 | 5.07 | | | L.A. |
| 1 ⅜ | 5.57 | .... | .... | L.A. |
| 1 7/16 | 6.09 | .... | 10-12 | 10-12 |
| 1 ½ | 6.63 | | 10-12 | 10-12 |

* In our New York plant. † In our Cleveland plant.

### COLD FINISHED SQUARES (Surface 4)

| Size in Inches | Wt. per Ft. in Lbs. | Annealed (Cond. C) | Heat Treated (Cond. F) |
|---|---|---|---|
| ¼ | 0.213 | 10-12 | |
| 5/16 | 0.332 | 10-12 | .... |
| ⅜ | 0.478 | 10-12 | L.A.10-12 |
| 7/16 | 0.651 | 10-12 | L.A.10-12 |
| ½ | 0.850 | 10-12 | L.A.10-12 |
| ⅝ | 1.33 | 10-12 | L.A.10-12 |
| ¾ | 1.91 | 10-12 | L.A.10-12 |
| ⅞ | 2.60 | 10-12 | L.A.10-12 |
| 1 | 3.40 | 10-12 | L.A.10-12 |

### AS ROLLED BILLETS

**Condition B—Surface 1**

In our Los Angeles plant

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet |
|---|---|---|
| 4 x4 | 54.40 | 12 |
| 6 x6 | 122.40 | 12 |
| 8 x8 | 217.60 | 12 |
| 9⅞x9⅞ | 331.55 | 12 |

## E 4130 BARS • *MIL-S-6758* (Cont'd)

**COLD FINISHED FLATS (Surface 4)**

| Size in Inches | Wt. per Ft. in Lbs. | **Annealed** (Cond. C) | **Heat Treated*** (Cond. F) |
|---|---|---|---|
| **1/4x** | | | |
| ½ | 0.425 | 10-12 | 10-12 |
| ¾ | 0.638 | 10-12 | 10-12 |
| 1 | 0.850 | 10-12 | 10-12 |
| **3/8x** | | | |
| ¾ | 0.956 | 10-12 | 10-12 |
| 1 | 1.28 | 10-12 | 10-12 |
| 1½ | 1.91 | 10-12 | 10-12 |
| **1/2x** | | | |
| ¾ | 1.28 | | 10-12 |
| 1 | 1.70 | 10-12 | 10-12 |
| 1¼ | 2.13 | .... | 10-12 |
| 1½ | 2.55 | 10-12 | 10-12 |
| 1¾ | 2.98 | | 10-12 |
| 2 | 3.40 | 10-12 | 10-12 |
| 2½ | 4.25 | 10-12 | 10-12 |
| 3 | 5.10 | 10-12 | 10-12 |
| **5/8x** | | | |
| 1 | 2.13 | 10-12 | 10-12 |
| 1½ | 3.19 | 10-12 | 10-12 |
| 2 | 4.25 | 10-12 | 10-12 |
| **3/4x** | | | |
| 1 | 2.55 | 10-12 | 10-12 |
| 1¼ | 3.19 | .... | 10-12 |
| 1½ | 3.83 | 10-12 | 10-12 |
| 1¾ | 4.46 | .... | 10-12 |
| 2 | 5.10 | 10-12 | 10-12 |
| 2½ | 6.38 | 10-12 | 10-12 |
| **1x** | | | |
| 1¼ | 4.25 | | 10-12 |
| 1½ | 5.10 | 10-12 | 10-12 |
| 2 | 6.80 | 10-12 | 10-12 |
| 2½ | 8.50 | 10-12 | 10-12 |
| 3 | 10.20 | 10-12 | 10-12 |
| 4 | 13.60 | 10-12 | 10-12 |
| **1-1/4x** | | | |
| 1½ | 6.38 | | 10-12 |
| 2 | 8.50 | 10-12 | 10-12 |
| 3 | 12.75 | 10-12 | 10-12 |
| 4 | 17.00 | 10-12 | 10-12 |
| **1-1/2x** | | | |
| 2 | 10.20 | 10-12 | 10-12 |
| 3 | 15.30 | 10-12 | 10-12 |
| 4 | 20.40 | 10-12 | 10-12 |

*In our Los Angeles plant.

## E 4140 BARS • *MIL-S-5626*

Identification Colors
**Annealed (Cond. C)** Black & Yellow with Orange Dot
**Normalized (Cond. D)** Black & Yellow with White Dot

E 4140 Chrome Molybdenum alloy steel is ordered to the Military Aero. Spec. These bars are Aircraft quality and can be Magnaflux inspected after machining.

### HOT ROLLED & COLD FINISHED ROUNDS

| Size in Inches | Wt. per Ft. in Lbs. | Hot Rolled Lengths (Surface 1) | | Cold Fin. Lgths. (Surface 4) |
|---|---|---|---|---|
| | | **Annealed*** | **Normalized†** | **Annealed** |
| 5/16 | .261 | | | L.A. |
| 3/8 | .376 | .... | .... | L.A. |
| 7/16 | .511 | .... | .... | L.A. |
| 1/2 | .668 | .... | .... | 10-12 |
| 9/16 | .845 | | | 10-12 |
| 5/8 | 1.04 | .... | .... | 10-12 |
| 11/16 | 1.26 | .... | .... | 10-12 |
| 3/4 | 1.50 | .... | .... | 10-12 |
| 13/16 | 1.76 | | | 10-12 |
| 7/8 | 2.04 | .... | .... | 10-12 |
| 15/16 | 2.35 | .... | .... | 10-12 |
| 1 | 2.67 | .... | .... | 10-12 |
| 1 1/16 | 3.01 | | | Clev. |
| 1 1/8 | 3.38 | .... | .... | 10-12 |
| 1 3/16 | 3.77 | .... | .... | Clev. |
| 1 1/4 | 4.17 | .... | .... | 10-12 |
| 1 5/16 | 4.60 | | | Clev. |
| 1 3/8 | 5.05 | .... | .... | 10-12 |
| 1 7/16 | 5.52 | .... | .... | Clev. |
| 1 1/2 | 6.01 | .... | .... | 10-12 |
| 1 5/8 | 7.05 | 14-16 | 10-12 | |
| 1 3/4 | 8.18 | 14-16 | 10-12 | .... |
| 1 7/8 | 9.39 | 14-16 | 10-12 | .... |
| 2 | 10.68 | 14-16 | 10-12 | .... |
| 2 1/8 | 12.06 | 14-16 | 10-12 | |
| 2 1/4 | 13.52 | 14-16 | 10-12 | .... |
| 2 1/2 | 16.69 | 14-16 | 10-12 | .... |
| 2 5/8 | 18.40 | 14-16 | 10-12 | .... |
| 2 3/4 | 20.19 | 14-16 | 10-12 | |
| 2 7/8 | 22.07 | 14-16 | 10-12 | .... |
| 3 | 24.03 | 14-16 | 10-12 | .... |
| 3 1/4 | 28.21 | 14-16 | 10-12 | .... |
| 3 1/2 | 32.71 | 14-16 | 10-12 | |
| 3 3/4 | 37.55 | 14-16 | 10-12 | .... |
| 4 | 42.73 | 14-16 | 10-12 | |
| 4 1/4 | 48.23 | .... | 10-12 | .... |
| 4 1/2 | 54.08 | .... | 10-12 | .... |
| 4 3/4 | 60.25 | .... | 10-12 | .... |
| 5 | 66.76 | | 10-12 | |
| 5 1/4 | 73.60 | .... | 10-12 | .... |
| 5 1/2 | 80.78 | .... | 10-12 | .... |
| 6 | 96.13 | .... | 10-12 | .... |
| 6 1/2 | 112.82 | .... | 10-12 | .... |
| 7 | 130.85 | | 10-12 | |

* In our Cleveland plant. † In our Los Angeles plant.

**COLD FINISHED HEXAGONS—Annealed**
Sizes 3/4" through 1 7/16" in our Los Angeles plant

**HOT ROLLED FLATS—Normalized or Annealed**
Sizes 1x2" through 3x6" in our Los Angeles plant

**AS ROLLED BILLETS** (In our Los Angeles plant)
Sizes range from 4" thru 9 7/8"

## E 4340 BARS • *AMS 6415 E*

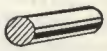
*Also conforms to MIL-S-5000*

Identification Color

**Annealed (Cond. C)** White & Yellow with Black Dot

E 4340 Chrome Nickel Molybdenum alloy steel is ordered to the Aeronautical Material Spec. and will conform to the chemical analysis of AISI E 4340. These bars are aircraft quality and can be Magnaflux inspected after machining.

### HOT ROLLED & COLD FINISHED ROUNDS



| Size in Inches | Wt. per Ft. in Lbs. | Hot Rolled Lgths. (Surface 1) **Annealed** | Cold Finished Lgths. (Surface 4) **Annealed** |
|---|---|---|---|
| 5/8 | 1.04 | .. | 10-12 |
| 11/16 | 1.26 | .. | 10-12 |
| 3/4 | 1.50 | 16 | 10-12 |
| 13/16 | 1.76 | .. | 10-12 |
| 7/8 | 2.04 | .. | 10-12 |
| 15/16 | 2.35 | .. | 10-12 |
| 1 | 2.67 | 16 | 10-12 |
| 1 1/16 | 3.01 | .. | 10-12 |
| 1 1/8 | 3.38 | 16 | 10-12 |
| 1 3/16 | 3.77 | .. | 10-12 |
| 1 1/4 | 4.17 | 16 | 10-12 |
| 1 5/16 | 4.60 | .. | 10-12 |
| 1 3/8 | 5.05 | 16 | 10-12 |
| 1 7/16 | 5.52 | .. | 10-12 |
| 1 1/2 | 6.01 | 16 | 10-12 |
| 1 9/16 | 6.52 | .. | Phil. |
| 1 5/8 | 7.05 | 16 | 10-12 |
| 1 3/4 | 8.18 | 16 | 10-12 |
| 1 7/8 | 9.39 | 16 | St.L. |
| 2 | 10.68 | 16 | 10-12 |
| 2 1/8 | 12.06 | 16 | 10-12 |
| 2 1/4 | 13.52 | 16 | 10-12 |
| 2 3/8 | 15.06 | L.A. | .... |
| 2 1/2 | 16.69 | 16 | 10-12 |
| 2 5/8 | 18.40 | 16 | 10-12 |
| 2 3/4 | 20.19 | 16 | 10-12 |
| 2 7/8 | 22.07 | L.A. | .... |
| 3 | 24.03 | 16 | 10-12 |
| 3 1/8 | 26.08 | L.A. | .... |
| 3 1/4 | 28.21 | 16 | 10-12 |
| 3 1/2 | 32.71 | 16 | 10-12 |
| 3 3/4 | 37.55 | 16 | 10-12 |
| 4 | 42.73 | 16 | 10-12 |
| 4 1/4 | 48.23 | 16 | .... |
| 4 1/2 | 54.08 | 16 | .... |
| 4 3/4 | 60.25 | L.A. | .... |
| 5 | 66.76 | 16 | .... |
| 5 1/4 | 73.60 | L.A. | .... |
| 5 1/2 | 80.78 | 16 | .... |
| 5 3/4 | 88.30 | L.A. | .... |
| 6 | 96.13 | 16 | .... |

**AS ROLLED BILLETS** (In our Los Angeles plant)

Sizes range from 4" thru 12"

## E 8740 • *AMS 6322 D*
## E 8740 MOD • *AMS 6324 A*
## E 9310 • *AMS 6260 E*

Identification Colors: E 8740 Orange and Yellow
E 8740 Mod Orange & Yellow, White Dot
E 9310 Gold and Green

E 8740, E 8740 Modified and E 9310 Nickel Chrome Molybdenum alloy steels, are ordered to AMS Specifications and will conform to the chemical analysis of AISI E 8740, E 8740 Modified or E 9310. These bars are aircraft quality and can be Magnaflux inspected after machining. They are annealed to provide the best machinability.

**HOT ROLLED & COLD FINISHED ROUNDS**
**Annealed (Cond. C)**

| Size in Inches | Wt. per Ft. in Lbs. | Stock Lengths in Feet | | | |
|---|---|---|---|---|---|
| | | Hot Rolled (Surface 1) | Cold Finished (Surface 4) | | |
| | | E 9310 | E 8740 | E 8740 Mod. | E 9310 |
| 3/8 | .376 | .. | 10-12 | 10-12 | .. |
| 7/16 | .511 | .. | 10-12 | 10-12 | .... |
| 1/2 | .668 | .. | 10-12 | 10-12 | .... |
| 9/16 | .845 | .. | 10-12 | 10-12 | .... |
| 5/8 | 1.04 | .. | 10-12 | 10-12 | .. |
| 11/16 | 1.26 | .. | 10-12 | 10-12 | .... |
| 3/4 | 1.50 | .. | 10-12 | 10-12 | .... |
| 13/16 | 1.76 | .. | 10-12 | 10-12 | .... |
| 7/8 | 2.04 | .. | 10-12 | 10-12 | 10-12 |
| 15/16 | 2.35 | .. | 10-12 | 10-12 | .... |
| 1 | 2.67 | .. | 10-12 | 10-12 | 10-12 |
| 1 1/16 | 3.01 | .. | 10-12 | 10-12 | .... |
| 1 1/8 | 3.38 | .. | 10-12 | 10-12 | 10-12 |
| 1 3/16 | 3.77 | .. | 10-12 | 10-12 | .... |
| 1 1/4 | 4.17 | .. | 10-12 | 10-12 | 10-12 |
| 1 5/16 | 4.60 | .. | 10-12 | 10-12 | .... |
| 1 3/8 | 5.05 | .. | 10-12 | 10-12 | 10-12 |
| 1 7/16 | 5.52 | .. | 10-12 | 10-12 | .... |
| 1 1/2 | 6.01 | .. | 10-12 | 10-12 | 10-12 |
| 1 5/8 | 7.05 | .. | 10-12 | 10-12 | 10-12 |
| 1 3/4 | 8.18 | .. | 10-12 | 10-12 | 10-12 |
| 1 7/8 | 9.39 | .. | 10-12 | 10-12 | 10-12 |
| 2 | 10.68 | 16 | 10-12 | 10-12 | .... |
| 2 1/4 | 13.52 | 16 | 10-12 | 10-12 | .... |
| 2 1/2 | 16.69 | 16 | 10-12 | 10-12 | .. |
| 2 3/4 | 20.19 | .. | 10-12 | 10-12 | .... |
| 3 | 24.03 | 16 | 10-12 | 10-12 | .... |
| 3 1/4 | 28.21 | 16 | .... | .... | .... |
| 3 1/2 | 32.71 | 16 | 10-12 | 10-12 | .. |
| 3 3/4 | 37.55 | 16 | .... | .... | .... |
| 4 | 42.73 | 16 | .... | .... | .... |
| 4 1/2 | 54.08 | 16 | .. | .. | .. |

# *Tool Steel*

## Oil and Water Hardening


**ROUNDS**

V.D. (Water Hardening) ..... 122, 124
Ry-Alloy (Oil Hardening) ..... 122, 124
Non-Tempering ..... 123, 129

**SQUARES**

V.D. (Water Hardening) ..... 122, 125
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**FLATS**

V.D. (Water Hardening) ..... 122, 125
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**HEXAGONS and OCTAGONS**

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V.D. (Water Hardening) ..... 122, 125
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**DRILL ROD**

Carbon Steel ..... 132
Ry-Alloy (Oil Hardening) ..... 131

## GUIDE TO SELECTION

**Ryerson Tool Steels** are made under our specifications with a balanced chemistry giving controlled hardening characteristics. They are tested in advance by heat treatment for degree of surface hardness, depth of hardness and core structure. Heat Treating instructions are furnished with every shipment. They show the proper temperature and quenching media as well as the hardness which will result after tempering at various temperatures. Annealing procedures, typical analysis and color identification are shown. Costly mix-ups are prevented and satisfactory heat treatment results made more certain with this extra service furnished with Ryerson Tool Steels.

**V.D.® TOOL STEEL** Identification Color: Black
Water Hardening • AISI-SAE W 2—1.00 C.V.

An all-purpose water hardening CarbonVanadium Tool Steel with remarkable hardening characteristics that permit a wide variation in treatment with uniformly good results. Although easy to machine, V.D. steel develops high hardness and toughness after heat treatment. Used for punches, blanking and forming dies, shear blades, bending dies, rivet sets, pneumatic and hand chisels, cutters, taps, shop tools, etc.—where uniform, high quality water hardening carbon tool steel is required.

We recommend hardening in water at 1425°-1450° F. for most applications, but on dies and parts which require a greater depth of hardness, temperatures as high as 1550° F. may be safely used. Even with a quench at 1550° F. the steel shows a fine grain structure and retains its toughness.

**Working Temperatures**—*Forging:* 1800 to 1950° F., never below 1500° F. *Hardening:* 1400 to 1550° F. *Annealing:* 1400 to 1450° F.

Effect of tempering on 2" disc ⅝" thick, water quenched at 1450° F.

| | As quenched | Tempering Temperature of | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 100° | 200° | 300° | 400° | 500° | 600° | 700° |
| Rockwell C | 67 | 67 | 67 | 65 | 62 | 59 | 55 | 51 |

Allow for size of section, equipment used and method of quenching.

**RY-ALLOY® TOOL STEEL** Identification Color: Red
Oil Hardening • AISI-SAE O 2

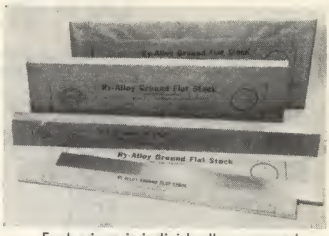
An oil hardening tool steel which combines high hardness and deep hardness penetration with minimum distortion, freedom from cracking and good machinability. Ry-Alloy has proven itself in a broad range of applications where a safer response to heat treatment is desired. Used for cams, rolls, thread rolling dies, thread chasers, blanking dies and punches, bushings, gauges, forming dies, and other parts requiring hardness, toughness and minimum distortion in hardening.

**Working Temperatures**—*Forging:* 1800 to 1925° F., never below 1550° F. *Hardening:* 1400 to 1475° F. *Annealing:* 1375 to 1425° F.

Effect of tempering on 1½" round quenched in oil at 1430° F.

| | As quenched | Tempering Temperature | | | | |
|---|---|---|---|---|---|---|
| | | 300° | 400° | 500° | 600° | 700° |
| Rockwell C | 64 | 62.5 | 60 | 57 | 53.5 | 51.5 |

Allow for size of section, equipment used and method of quenching.



Each piece is individually wrapped

**RY-ALLOY** *Ground Flat Stock* is the same outstanding non-deforming tool steel described on the previous page with one important plus feature—it is *accurately ground on all four sides*, eliminating the need for grinding on many parts and making an excellent surface for layout work on others. Sides and ends are square, parallel and accurate to dimension. All sizes are guaranteed free of surface decarburization and are spheroidize annealed for best machinability. It is produced in standard thicknesses within limits of plus or minus .001″; in widths within limits of plus .005″, minus .000″. Used for templates, jigs, gages, fixtures, stamps, shims, machine parts, tools, dies, etc.

**RY-ALLOY DRILL ROD**—All the advantages of non-deforming Ry-Alloy tool steel are present in Ry-Alloy Drill Rod—plus excellent finish, size accuracy and freedom from decarburization.

**V.D. CHISEL STEEL** Identification Color: Black

A specially developed water hardening Carbon Molybdenum tool steel ideal for hand and pneumatic chisels. Designed for use not only in the highly controlled and fully equipped heat treating shop but also to fulfill the needs of the "harden-by-eye" craftsman.

**NON-TEMPERING STEEL** Identification Color: Black & Yellow

Designed for applications when tempering is impractical either because of cost or lack of facilities. A good shock-resistant steel with strong wear-resistant characteristics when hardened. This steel has proven its superiority in such applications as chisels, punches, moils, pinch bars, etc.

Harden by heating to a bright red (1550-1600° F.) and quench in oil or water. Oil should be used when section is intricate or application warrants this type of coolant.

Approx. Surface Hardness—Oil Quenched

| Size in Inches: | ½ | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Rockwell | 56 | 55 | 54 | 51 | 43 | 39 |
| Brinell | 577 | 560 | 543 | 496 | 400 | 362 |

**CARBON STEEL DRILL ROD**

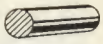
A high grade drill rod made of good tool steel and finished with extreme size accuracy and a smooth finish. Used for dowel pins, mandrels, punches, plungers, automatically machined parts, roller bearings, shafts, small tools and dies, etc.

**TOOL STEEL SHEETS**

Suitable for small tools, springs, shims, scrapers, blades, saws, knives, etc. Rolled from high grade tool steel of about 1.00% Carbon. Sheets have a smooth blue finish, protected by oil. Can be hardened in oil or water at approximately 1425° F. Selection of quenching medium depends upon hardness desired.

## V.D. • RY-ALLOY

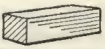
**ROUNDS**
**Spheroidize Annealed** (Machine Straightened)



| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet | |
|---|---|---|---|
| | | V.D. | RY-ALLOY |
| ¼ | 0.167 | 10-12 | .... |
| 5/16 | 0.261 | 10-12 | .... |
| ⅜ | 0.376 | 10-12 | .... |
| 7/16 | 0.511 | 10-12 | .... |
| ½ | 0.668 | 10-12 | 12-14 |
| 9/16 | 0.845 | 10-12 | .... |
| ⅝ | 1.04 | 10-12 | 12-14 |
| 11/16 | 1.26 | 10-12 | .... |
| ¾ | 1.50 | 10-12 | 12-14 |
| 13/16 | 1.76 | 10-12 | .... |
| ⅞ | 2.04 | 10-12 | 12-14 |
| 15/16 | 2.35 | 10-12 | .... |
| 1 | 2.67 | 10-12 | 12-14 |
| 1 1/16 | 3.01 | 10-12 | .... |
| 1 ⅛ | 3.38 | 10-12 | 12.14 |
| 1 3/16 | 3.77 | 10-12 | .... |
| 1 ¼ | 4.17 | 10-12 | 12-14 |
| 1 5/16 | 4.60 | 10-12 | .... |
| 1 ⅜ | 5.05 | 10-12 | 12-14 |
| 1 7/16 | 5.52 | 10-12 | .... |
| 1 ½ | 6.01 | 10-12 | 12-14 |
| 1 ⅝ | 7.05 | 10-12 | 12-14 |
| 1 ¾ | 8.18 | 10-12 | 12-14 |
| 1 ⅞ | 9.39 | 10-12 | 12-14 |
| 2 | 10.68 | 10-12 | 12-14 |
| 2 ⅛ | 12.06 | 10-12 | 12-14 |
| 2 ¼ | 13.52 | 10-12 | 12-14 |
| 2 ⅜ | 15.06 | 10-12 | 12-14 |
| 2 ½ | 16.69 | 10-12 | 12-14 |
| 2 ⅝ | 18.40 | 10-12 | 12-14 |
| 2 ¾ | 20.19 | 10-12 | 12-14 |
| 2 ⅞ | 22.07 | 10-12 | 12-14 |
| 3 | 24.03 | 10-12 | 12-14 |
| 3 ⅛ | 26.08 | 10-12 | 12-14 |
| 3 ¼ | 28.21 | 10-12 | 12-14 |
| 3 ½ | 32.71 | 10-12 | 12-14 |
| 3 ⅝ | 35.09 | 10-12 | 12-14 |
| 3 ¾ | 37.55 | 10-12 | 12-14 |
| 4 | 42.73 | 10-12 | 12-14 |
| 4 ¼ | 48.23 | 10-12 | 12-14 |
| 4 ½ | 54.08 | 10-12 | 12-14 |
| 4 ¾ | 60.25 | 10-12 | 12-14 |
| 5 | 66.76 | 10-12 | 12-14 |
| 5 ¼ | 73.60 | 10-12 | 12-14 |
| 5 ½ | 80.78 | 10-12 | 12-14 |
| 5 ¾ | 88.29 | 10-12 | 12-14 |
| 6 | 96.13 | 10-12 | 12-14 |
| 6 ¼ | 104.31 | .... | 12-14 |
| 6 ½ | 112.82 | 10-12 | 12-14 |
| 6 ¾ | 121.67 | .... | 12-14 |
| 7 | 130.85 | 10-12 | 12-14 |
| 7 ¼ | 140.36 | 10-12 | .... |
| 7 ½ | 150.21 | 10-12 | 12-14 |
| 8 | 170.90 | 10-12 | 12-14 |
| 8 ¼ | 181.75 | .... | 12-14 |
| 8 ½ | 192.93 | .... | 12-14 |
| 9 | 216.30 | 10-12 | 12-14 |

## V.D. • RY-ALLOY

**SQUARES**
**Spheroidize Annealed** (Machine Straightened)



| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet | |
|---|---|---|---|
| | | V.D. | RY-ALLOY |
| ¼ | 0.213 | 10-12 | .... |
| 5/16 | 0.332 | 10-12 | .... |
| ⅜ | 0.478 | 10-12 | .... |
| ½ | 0.850 | 10-12 | .... |
| 9/16 | 1.08 | 10-12 | .... |
| ⅝ | 1.33 | 10-12 | .... |
| ¾ | 1.91 | 10-12 | 12-14 |
| ⅞ | 2.60 | 10-12 | .... |
| 1 | 3.40 | 10-12 | 12-14 |
| 1⅛ | 4.30 | 10-12 | .... |
| 1¼ | 5.31 | 10-12 | 12-14 |
| 1½ | 7.65 | 10-12 | 12-14 |
| 1¾ | 10.41 | 10-12 | 12-14 |
| 2 | 13.60 | 10-12 | 12-14 |
| 2¼ | 17.21 | 10-12 | 12-14 |
| 2½ | 21.25 | 10-12 | 12-14 |
| 2¾ | 25.71 | 10-12 | 12-14 |
| 3 | 30.60 | 10-12 | 12-14 |
| 3½ | 41.65 | 10-12 | 12-14 |
| 4 | 54.40 | 10-12 | 12-14 |
| 4½ | 68.85 | 10-12 | 12-14 |
| 5 | 85.00 | 10-12 | .... |
| 6 | 122.40 | 10-12 | 12-14 |
| **SQUARE BILLETS—Annealed** | | | |
| 4x4 | 54.40 | 8-10 | 8-10 |
| 6x6 | 122.40 | 10-12 | 12-14 |
| 8x8 | 217.60 | | 12-14 |

**FLATS**
**Spheroidize Annealed** (Machine Straightened)

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet | |
|---|---|---|---|
| | | V.D. | RY-ALLOY |
| ⅛ x ⅝ | 0.266 | 10-12 | .... |
| ¾ | 0.319 | 10-12 | .... |
| 1 | 0.425 | 10-12 | .... |
| 1¼ | 0.531 | 10-12 | .... |
| 1½ | 0.638 | 10-12 | .... |
| 2 | 0.850 | 10-12 | .... |
| 3/16x ¾ | 0.478 | 10-12 | .... |
| 1 | 0.638 | 10-12 | .... |
| 1¼ | 0.797 | 10-12 | .... |
| 1½ | 0.956 | 10-12 | .... |
| 2 | 1.28 | 10-12 | .... |
| 2½ | 1.59 | 10-12 | .... |
| 3 | 1.91 | 10-12 | .... |
| ¼ x ½ | 0.425 | 10-12 | .... |
| ⅝ | 0.531 | 10-12 | .... |
| ¾ | 0.638 | 10-12 | .... |
| ⅞ | 0.744 | 10-12 | .... |
| 1 | 0.850 | 10-12 | .... |
| 1¼ | 1.06 | 10-12 | .... |
| 1½ | 1.28 | 10-12 | .... |
| 1¾ | 1.49 | 10-12 | .... |
| 2 | 1.70 | 10-12 | .... |
| 2¼ | 1.91 | 10-12 | .... |

(Continued)

## V.D. • RY-ALLOY

**FLATS, *Continued***
**Spheroidize Annealed** (Machine Straightened)

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet | |
|---|---|---|---|
| | | V.D. | RY-ALLOY |
| ¼x2½ | 2.13 | 10-12 | .... |
| 3 | 2.55 | 10-12 | .... |
| 3½ | 2.98 | 10-12 | .... |
| 4 | 3.40 | 10-12 | .... |
| 6 | 5.10 | 10-12 | .... |
| 5/16x¾ | 0.797 | 10-12 | .... |
| 1 | 1.06 | 10-12 | .... |
| 1¼ | 1.33 | 10-12 | .... |
| 1½ | 1.59 | 10-12 | .... |
| 2 | 2.13 | 10-12 | .... |
| 2½ | 2.67 | 10-12 | .... |
| 3 | 3.19 | 10-12 | .... |
| 3½ | 3.72 | 10-12 | .... |
| ⅜x ¾ | 0.956 | 10-12 | .... |
| 1 | 1.28 | 10-12 | 12-14 |
| 1⅛ | 1.43 | 10-12 | .... |
| 1¼ | 1.59 | 10-12 | .... |
| 1½ | 1.91 | 10-12 | 12-14 |
| 1¾ | 2.23 | 10-12 | .... |
| 2 | 2.55 | 10-12 | 12-14 |
| 2¼ | 2.87 | 10-12 | .... |
| 2½ | 3.19 | 10-12 | .... |
| 3 | 3.83 | 10-12 | .... |
| 3½ | 4.46 | 10-12 | .... |
| 4 | 5.10 | 10-12 | 12-14 |
| 5 | 6.38 | 10-12 | .... |
| 6 | 7.65 | 10-12 | 12-14 |
| ½x ¾ | 1.28 | 10-12 | .... |
| 1 | 1.70 | 10-12 | .... |
| 1¼ | 2.13 | 10-12 | 12-14 |
| 1½ | 2.55 | 10-12 | 12-14 |
| 1⅝ | 2.76 | 10-12 | .... |
| 1¾ | 2.98 | 10-12 | 12-14 |
| 2 | 3.40 | 10-12 | 12-14 |
| 2½ | 4.25 | 10-12 | 12-14 |
| 3 | 5.10 | 10-12 | 12-14 |
| 3½ | 5.95 | 10-12 | .... |
| 4 | 6.80 | 10-12 | 12-14 |
| 5 | 8.50 | 10-12 | 12-14 |
| 6 | 10.20 | 10-12 | 12-14 |
| ⅝x1 | 2.13 | 10-12 | 12-14 |
| 1¼ | 2.66 | 10-12 | 12-14 |
| 1½ | 3.19 | 10-12 | 12-14 |
| 1¾ | 3.72 | 10-12 | 12-14 |
| 2 | 4.25 | 10-12 | 12-14 |
| 2½ | 5.31 | 10-12 | 12-14 |
| 3 | 6.38 | 10-12 | 12-14 |
| 4 | 8.50 | 10-12 | 12-14 |
| 5 | 10.63 | 10-12 | .... |
| 6 | 12.75 | 10-12 | 12-14 |
| ¾x1 | 2.55 | 10-12 | 12-14 |
| 1¼ | 3.19 | 10-12 | 12-14 |
| 1½ | 3.83 | 10-12 | 12-14 |
| 1¾ | 4.46 | 10-12 | .... |
| 2 | 5.10 | 10-12 | 12-14 |
| 2¼ | 5.74 | .... | 12-14 |
| 2½ | 6.38 | 10-12 | 12-14 |
| 3 | 7.65 | 10-12 | 12-14 |

(*Continued*)

## V.D. • RY-ALLOY

**FLATS, *Continued***
**Spheroidize Annealed** (Machine Straightened)

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet | |
|---|---|---|---|
| | | V.D. | RY-ALLOY |
| ¾ x3½ | 8.93 | 10-12 | 12-14 |
| 4 | 10.20 | 10-12 | 12-14 |
| 4½ | 11.48 | .... | 12-14 |
| 5 | 12.75 | 10-12 | 12-14 |
| 5½ | 14.03 | .... | 12-14 |
| 6 | 15.30 | 10-12 | 12-14 |
| 8 | 20.40 | .... | 12-14 |
| ⅞ x1¼ | 3.72 | 10-12 | .... |
| 1½ | 4.46 | 10-12 | .... |
| 1¾ | 5.21 | 10-12 | .... |
| 2 | 5.95 | 10-12 | .... |
| 2½ | 7.44 | 10-12 | .... |
| 3 | 8.93 | 10-12 | .... |
| 4 | 11.90 | 10-12 | .... |
| 5 | 14.88 | 10-12 | .... |
| 6 | 17.85 | 10-12 | .... |
| 1 x1¼ | 4.25 | 10-12 | 12-14 |
| 1½ | 5.10 | 10-12 | 12-14 |
| 1¾ | 5.95 | 10-12 | .... |
| 2 | 6.80 | 10-12 | 12-14 |
| 2¼ | 7.65 | 10-12 | 12-14 |
| 2½ | 8.50 | 10-12 | 12-14 |
| 3 | 10.20 | 10-12 | 12-14 |
| 3½ | 11.90 | 10-12 | 12-14 |
| 4 | 13.60 | 10-12 | 12-14 |
| 4½ | 15.30 | .... | 12-14 |
| 5 | 17.00 | 10-12 | 12-14 |
| 5½ | 18.70 | .... | 12-14 |
| 6 | 20.40 | 10-12 | 12-14 |
| 7 | 23.80 | .... | 12-14 |
| 8 | 27.20 | 10-12 | 12-14 |
| 10 | 34.00 | 10-12 | .... |
| 12 | 40.80 | .... | 12-14 |
| 1¼ x1½ | 6.38 | 10-12 | 12-14 |
| 1¾ | 7.44 | 10-12 | .... |
| 2 | 8.50 | 10-12 | 12-14 |
| 2¼ | 9.56 | 10-12 | .... |
| 2½ | 10.63 | 10-12 | 12-14 |
| 3 | 12.75 | 10-12 | 12-14 |
| 3½ | 14.88 | 10-12 | 12-14 |
| 4 | 17.00 | 10-12 | 12-14 |
| 4½ | 19.13 | .... | 12-14 |
| 5 | 21.25 | 10-12 | 12-14 |
| 5½ | 23.38 | .... | 12-14 |
| 6 | 25.50 | 10-12 | 12-14 |
| 7 | 29.76 | 10-12 | .... |
| 8 | 34.00 | 10-12 | 12-14 |
| 12 | 51.00 | .... | 12-14 |
| 1½ x2 | 10.20 | 10-12 | 12-14 |
| 2½ | 12.75 | 10-12 | 12-14 |
| 3 | 15.30 | 10-12 | 12-14 |
| 3½ | 17.85 | 10-12 | 12-14 |
| 4 | 20.40 | 10-12 | 12-14 |
| 4½ | 22.95 | 10-12 | 12-14 |
| 5 | 25.50 | 10-12 | 12-14 |
| 5½ | 28.05 | .... | 12-14 |
| 6 | 30.60 | 10-12 | 12-14 |
| 7 | 35.70 | .... | 12-14 |
| 8 | 40.80 | 10-12 | 12-14 |

(Continued)

## V.D. • RY-ALLOY

**FLATS, *Continued***

**Spheroidize Annealed** (Machine Straightened)

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet | |
|---|---|---|---|
| | | V.D. | RY-ALLOY |
| 1¾x2 | 11.90 | 10-12 | 12-14 |
| 2¼ | 13.39 | .... | 12-14 |
| 2½ | 14.87 | 10-12 | 12-14 |
| 3 | 17.85 | 10-12 | 12-14 |
| 3½ | 20.83 | 10-12 | 12-14 |
| 4 | 23.80 | 10-12 | 12-14 |
| 4½ | 26.78 | .... | 12-14 |
| 5 | 29.75 | 10-12 | 12-14 |
| 6 | 35.70 | 10-12 | 12-14 |
| 7 | 41.65 | .... | 12-14 |
| 8 | 47.60 | .... | 12-14 |
| 10 | 59.50 | | 12-14 |
| 2 x2½ | 17.00 | 10-12 | 12-14 |
| 3 | 20.40 | 10-12 | 12-14 |
| 3½ | 23.80 | 10-12 | 12-14 |
| 4 | 27.20 | 10-12 | 12-14 |
| 4½ | 30.60 | | 12-14 |
| 5 | 34.00 | 10-12 | 12-14 |
| 6 | 40.80 | 10-12 | 12-14 |
| 7 | 47.60 | .... | 12-14 |
| 8 | 54.40 | 10-12 | 12-14 |
| 10 | 68.00 | | 12-14 |
| 2¼x2½ | 19.13 | 10-12 | 12-14 |
| 3 | 22.95 | 10-12 | 12-14 |
| 3½ | 26.78 | 10-12 | 12-14 |
| 4 | 30.60 | 10-12 | 12-14 |
| 4½ | 34.43 | 10-12 | |
| 5 | 38.25 | .... | 12-14 |
| 6 | 45.90 | 10-12 | 12-14 |
| 8 | 61.20 | 10-12 | |
| 2½x3 | 25.50 | 10-12 | 12-14 |
| 3½ | 29.75 | 10-12 | 12-14 |
| 4 | 34.00 | 10-12 | 12-14 |
| 4½ | 38.25 | 10-12 | 12-14 |
| 5 | 42.50 | 10-12 | 12-14 |
| 5½ | 46.75 | .... | 12-14 |
| 6 | 51.00 | 10-12 | 12-14 |
| 8 | 68.00 | .... | 12-14 |
| 10 | 85.00 | | 12-14 |
| 3 x3½ | 35.70 | | 12-14 |
| 4 | 40.80 | 10-12 | 12-14 |
| 4½ | 45.90 | .... | 12-14 |
| 5 | 51.00 | 10-12 | 12-14 |
| 6 | 61.20 | 10-12 | 12-14 |
| 7 | 71.40 | .... | 12-14 |
| 8 | 81.60 | .... | 12-14 |
| 10 | 102.00 | | 12-14 |
| 3½x4 | 47.60 | | 12-14 |
| 5 | 59.50 | .... | 12-14 |
| 6 | 71.40 | .... | 12-14 |
| 8 | 95.20 | | 12-14 |
| 4 x6 | 81.60 | | 12-14 |

## RYERSON TOOL STEEL SHEETS Semi-Annealed

Used for small tools, springs, shims, scrapers, blades, saws, knives, etc. Rolled from high grade tool steel.

| Thickness Inches, or B.W. Ga. | Est. Wt. per Lineal Ft. in Lbs. | Sheet Size in Inches | Thickness Inches, or B.W. Ga. | Est. Wt. per Lineal Ft. in Lbs. | Sheet Size in Inches |
|---|---|---|---|---|---|
| ¼ | 20.40 | 24x60-72 | 19 | 3.43 | 24x60-72 |
| 5/16 | 15.31 | 24x60-72 | 20 | 2.85 | 24x60-72 |
| 10 | 10.93 | 24x60-72 | 21 | 2.61 | 24x60-72 |
| 11 | 9.79 | 24x60-72 | 22 | 2.28 | 24x60-72 |
| 12 | 8.89 | 24x60-72 | 23 | 1.53 | 18x60-72 |
| 13 | 7.75 | 24x60-72 | 24 | 1.35 | 18x60-72 |
| 14 | 6.77 | 24x60-72 | 25 | 1.22 | 18x60-72 |
| 15 | 5.89 | 24x60-72 | 26 | 1.10 | 18x60-72 |
| 16 | 5.31 | 24x60-72 | 27 | .979 | 18x60-72 |
| 18 | 4.00 | 24x60-72 | 28 | .86 | 18x60-72 |

## V.D. CHISEL STEEL

A specially developed water hardening Carbon Molybdenum tool steel for hand and pneumatic chisels.

**OCTAGONS—Not Annealed**

| Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet | Size in Inches | Wt. per Ft. in Lbs. | Random Lengths in Feet |
|---|---|---|---|---|---|
| 1/4 | 0.176 | 12-14 | 7/8 | 2.16 | 12-14 |
| 5/16 | 0.275 | 12-14 | 1 | 2.82 | 12-14 |
| 3/8 | 0.396 | 12-14 | 1 1/8 | 3.57 | 12-14 |
| 1/2 | 0.704 | 12-14 | 1 1/4 | 4.40 | 12-14 |
| 5/8 | 1.10 | 12-14 | 1 1/2 | 6.34 | 12-14 |
| 3/4 | 1.58 | 12-14 | | | |

**HEXAGONS—Not Annealed**

| | | | | | |
|---|---|---|---|---|---|
| 5/16 | 0.288 | 12-14 | 7/8 | 2.25 | 12-14 |
| 3/8 | 0.414 | 12-14 | 1 | 2.94 | 12-14 |
| 1/2 | 0.736 | 12-14 | 1 1/8 | 3.73 | 12-14 |
| 5/8 | 1.15 | 12-14 | 1 1/4 | 4.60 | 12-14 |
| 3/4 | 1.66 | 12-14 | 1 1/2 | 6.63 | 12-14 |

## NON-TEMPERING STEEL —Annealed

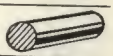
Designed for applications when tempering is impractical. Used for chisels, punches, moils, pinch bars, etc.

**COLD FINISHED HEXAGONS**

Random Lengths: 10 to 12 Ft.; over 2 3/8" 10 to 13 Ft.

| Size in Inches | Wt. per Ft. in Lbs. | Size in Inches | Wt. per Ft. in Lbs. | Size in Inches | Wt. per Ft. in Lbs. |
|---|---|---|---|---|---|
| 3/8 | 0.414 | 15/16 | 2.59 | 1 5/8 | 7.78 |
| 7/16 | 0.564 | 1 | 2.94 | 1 3/4 | 9.02 |
| 1/2 | 0.736 | 1 1/16 | 3.32 | 1 13/16 | 9.67 |
| 9/16 | 0.932 | 1 1/8 | 3.73 | 1 7/8 | 10.35 |
| 5/8 | 1.15 | 1 1/4 | 4.60 | 2 | 11.78 |
| 11/16 | 1.39 | 1 5/16 | 5.07 | 2 1/4 | 14.91 |
| 3/4 | 1.66 | 1 3/8 | 5.57 | 2 3/8 | 16.61 |
| 13/16 | 1.94 | 1 7/16 | 6.09 | 2 1/2 | 18.40 |
| 7/8 | 2.25 | 1 1/2 | 6.63 | 3 | 26.50 |

**COLD FINISHED ROUNDS**



| | | | | | |
|---|---|---|---|---|---|
| 1/4 | 0.167 | 1 5/8 | 7.05 | 2 7/8 | 22.07 |
| 3/8 | 0.376 | 1 3/4 | 8.18 | 3 | 24.03 |
| 1/2 | 0.668 | 1 7/8 | 9.39 | 3 1/4 | 28.21 |
| 5/8 | 1.04 | 2 | 10.68 | 3 1/2 | 32.71 |
| 3/4 | 1.50 | 2 1/8 | 12.06 | 3 3/4 | 37.55 |
| 7/8 | 2.04 | 2 1/4 | 13.52 | 4 | 42.73 |
| 1 | 2.67 | 2 3/8 | 15.06 | 4 1/4 | 48.23 |
| 1 1/8 | 3.38 | 2 1/2 | 16.69 | 4 1/2 | 54.08 |
| 1 1/4 | 4.17 | 2 5/8 | 18.40 | 4 3/4 | 60.25 |
| 1 3/8 | 5.05 | 2 3/4 | 20.19 | 5 | 66.76 |
| 1 1/2 | 6.01 | | | | |

**COLD FINISHED SQUARES**

| | | | | | |
|---|---|---|---|---|---|
| 1/4 | 0.213 | 5/8 | 1.33 | 1 1/4 | 5.31 |
| 5/16 | 0.332 | 11/16 | 1.61 | 1 3/8 | 6.43 |
| 3/8 | 0.478 | 3/4 | 1.91 | 1 1/2 | 7.65 |
| 7/16 | 0.651 | 7/8 | 2.60 | 1 3/4 | 10.41 |
| 1/2 | 0.850 | 1 | 3.40 | 2 | 13.60 |
| 9/16 | 1.08 | 1 1/8 | 4.30 | | |

## RY-ALLOY GROUND FLAT STOCK

**OIL HARDENING • AISI, SAE O2**

***Guaranteed free from surface decarburization***

Ry-Alloy Ground Flat Stock is made from a high grade, non-deforming, oil hardening tool steel and is accurately ground on *all four sides*. Sides and ends are square, parallel and accurate to dimension. Widely used to economically produce small parts that must have a smooth surface and be accurate to thickness—templates, jigs, gauges, fixtures, shims, etc. Hardens up to Rockwell C-63.

**18" LENGTHS—Spheroidize Annealed**

| Thickness & Width in Inches | Weight each pc. in Lbs. |
|---|---|
| **1/64x** | |
| 1 | .08 |
| 1½ | .12 |
| 2 | .16 |
| 2½ | .20 |
| 3 | .24 |
| 4 | .32 |
| **1/32x** | |
| ½ | .08 |
| ¾ | .12 |
| 1 | .16 |
| 1½ | .24 |
| 2 | .32 |
| 2½ | .40 |
| 3 | .48 |
| 3½ | .56 |
| 4 | .64 |
| 5 | .80 |
| 6 | .96 |
| **3/64x** | |
| ½ | .12 |
| 1 | .24 |
| 1½ | .36 |
| 2 | .48 |
| 2½ | .60 |
| 3 | .72 |
| 4 | .96 |
| 5 | 1.20 |
| 6 | 1.43 |
| **1/16x** | |
| ½ | .16 |
| ¾ | .24 |
| 1 | .32 |
| 1¼ | .40 |
| 1½ | .48 |
| 2 | .64 |
| 2½ | .80 |
| 3 | .96 |
| 3½ | 1.12 |
| 4 | 1.27 |
| 5 | 1.59 |
| 6 | 1.91 |
| **3/32x** | |
| ½ | .24 |
| ¾ | .36 |
| 1 | .48 |
| 1½ | .72 |
| 2 | .96 |
| 2½ | 1 20 |
| **3/32x** | |
| 3 | 1.43 |
| 3½ | 1.67 |
| 4 | 1.91 |
| 5 | 2.39 |
| 6 | 2.87 |
| **1/8x** | |
| ½ | .32 |
| ¾ | .48 |
| 1 | .64 |
| 1¼ | .80 |
| 1½ | .96 |
| 2 | 1.27 |
| 2½ | 1.59 |
| 3 | 1.91 |
| 3½ | 2.23 |
| 4 | 2.55 |
| 5 | 3.19 |
| 6 | 3.82 |
| **5/32x** | |
| ½ | .40 |
| ¾ | .60 |
| 1 | .80 |
| 1½ | 1.20 |
| 2 | 1.59 |
| 2½ | 1.99 |
| 3 | 2.39 |
| 3½ | 2.79 |
| 4 | 3.19 |
| **3/16x** | |
| ½ | .48 |
| ¾ | .72 |
| 1 | .96 |
| 1¼ | 1.20 |
| 1½ | 1.43 |
| 2 | 1.91 |
| 2½ | 2.39 |
| 3 | 2.87 |
| 3½ | 3.35 |
| 4 | 3.82 |
| 5 | 4.78 |
| 6 | 5.74 |
| **7/32x** | |
| 1 | 1.12 |
| 1½ | 1.67 |
| 2 | 2 23 |
| 2½ | 2.79 |
| 3 | 3.35 |
| 4 | 4.46 |
| **1/4x** | |
| ¼ | .32 |
| ½ | .64 |
| ¾ | .96 |
| 1 | 1.27 |
| 1½ | 1.91 |
| 2 | 2.55 |
| 2½ | 3.19 |
| 3 | 3.82 |
| 3½ | 4.47 |
| 4 | 5.10 |
| 5 | 6.37 |
| 6 | 7.65 |
| **5/16x** | |
| 5/16 | .50 |
| ½ | .80 |
| 1 | 1.59 |
| 1½ | 2.39 |
| 2 | 3.19 |
| 2½ | 3.98 |
| 3 | 4.78 |
| 4 | 6.38 |
| 5 | 7.97 |
| 6 | 9.56 |
| **3/8x** | |
| ⅜ | .72 |
| ½ | .96 |
| ¾ | 1.43 |
| 1 | 1.91 |
| 1½ | 2.87 |
| 2 | 3.82 |
| 2½ | 4.78 |
| 3 | 5.74 |
| 4 | 7.65 |
| 5 | 9.56 |
| 6 | 11.48 |
| **1/2x** | |
| ½ | 1.27 |
| ¾ | 1.91 |
| 1 | 2.55 |
| 1½ | 3.83 |
| 2 | 5.10 |
| 3 | 7.65 |
| 4 | 10.20 |
| 5 | 12.75 |
| 6 | 15.30 |
| **5/8x** | |
| ⅝ | 1.99 |
| 1 | 3.19 |

(Continued)

## RY-ALLOY GROUND FLAT STOCK, *Continued*

| Thickness & Width in Inches | Weight each pc. in Lbs. | Thickness & Width in Inches | Weight each pc. in Lbs. | Thickness & Width in Inches | Weight each pc. in Lbs. |
|---|---|---|---|---|---|
| **5/8x** | | **3/4x** | | **1-1/4x** | |
| 2 | 6.37 | 5 | 19.13 | 2 | 12.75 |
| 3 | 9.56 | 6 | 22.95 | 4 | 25.50 |
| 4 | 12.75 | | | 6 | 38.25 |
| 5 | 15.94 | **1x** | | 8 | 51.00 |
| 6 | 19.13 | 1 | 5.10 | 10 | 63.75 |
| | | 1½ | 7.65 | **1-1/2x** | |
| **3/4x** | | 2 | 10.20 | 1½ | 10.48 |
| ¾ | 2.87 | 3 | 15.30 | 3 | 20.92 |
| 1 | 3.83 | 4 | 20.40 | 4 | 30.60 |
| 2 | 7.65 | 6 | 30.60 | 6 | 41.84 |
| 3 | 11.48 | 8 | 40.80 | 8 | 61.20 |
| 4 | 15.30 | 10 | 51.00 | 10 | 72.44 |

**36" LENGTHS**

| | | | | | |
|---|---|---|---|---|---|
| **1/2x** | | **3/4x** | | **1x** | |
| 2 | 10.20 | 2 | 15.30 | 8 | 81.60 |
| 3 | 15.30 | 3 | 22.96 | 10 | 102.00 |
| 4 | 20.40 | 4 | 30.60 | | |
| 5 | 25.50 | 6 | 25.90 | | |
| 6 | 31.50 | | | **1-1/4x** | |
| **5/8x** | | **1x** | | 2 | 25.50 |
| 2 | 12.74 | 2 | 20.40 | 4 | 51.00 |
| 3 | 19.12 | 3 | 30.60 | 6 | 76.50 |
| 4 | 25.50 | 4 | 40.80 | 8 | 102.00 |
| 6 | 38.26 | 6 | 61.20 | 10 | 127.50 |

## RY-ALLOY DRILL ROD

### OIL HARDENING • AISI, SAE 02

*Guaranteed free from Surface Decarburization*

Ry-Alloy oil hardening drill rod is produced with an excellent finish and extreme size accuracy. Used where minimum distortion coupled with excellent response to heat treatment is desired—in such applications as plugs, dies, knockout pins, punches, etc.

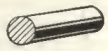
**POLISHED ROUNDS—3 Foot Lengths**

| Size in Inches | Wt. per 3 Foot Length | Size in Inches | Wt. per 3 Foot Length | Size in Inches | Wt. per 3 Foot Length |
|---|---|---|---|---|---|
| 1/16 | .030 | 5/16 | .780 | 9/16 | 2.532 |
| 5/64 | .051 | 21/64 | .861 | 19/32 | 2.824 |
| 3/32 | .069 | 11/32 | .939 | 5/8 | 3.126 |
| 7/64 | .093 | 23/64 | 1.035 | 11/16 | 3.750 |
| 1/8 | .126 | 3/8 | 1.125 | 3/4 | 4.500 |
| 9/64 | .156 | 25/64 | 1.221 | 13/16 | 5.250 |
| 5/32 | .198 | 13/32 | 1.311 | 7/8 | 6.126 |
| 11/64 | .234 | 27/64 | 1.416 | 15/16 | 6.999 |
| 3/16 | .282 | 7/16 | 1.530 | 31/32 | 7.593 |
| 13/64 | .327 | 29/64 | 1.626 | 1 | 7.998 |
| 7/32 | .387 | 15/32 | 1.749 | 1 1/16 | 9.030 |
| 15/64 | .441 | 31/64 | 1.875 | 1 1/8 | 10.125 |
| 1/4 | .501 | 1/2 | 2.001 | 1 1/4 | 12.501 |
| 17/64 | .561 | 33/64 | 2.127 | 1 3/8 | 15.147 |
| 9/32 | .639 | 17/32 | 2.250 | 1 1/2 | 18.000 |
| 19/64 | .702 | | | | |

## RYERSON CARBON STEEL DRILL ROD

A high grade drill rod made of good tool steel and finished with extreme size accuracy and a smooth finish. Used for dowel pins, mandrels, punches, plungers, automatic screw machine product parts, roller bearings, shafts, small tools and dies, etc.

### POLISHED ROUNDS



*Guaranteed free from surface decarburization*

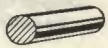
3 Foot Lengths: Sizes Marked * also carried in 12 Foot Lengths

| Decimal Diam. | Size | Wt. per 3 Ft. Piece in Lbs. | Decimal Diam. | Size | Wt. per 3 Ft. Piece in Lbs. |
|---|---|---|---|---|---|
| .0469 | 3/64 | .018 | .188 | 11 | .282 |
| .0625 | 1/16 | .0300 | .191 | 10 | .288 |
| .063 | 52 | .0330 | .194 | 9 | .297 |
| .066 | 51 | .0360 | .197 | 8 | .312 |
| .069 | 50 | .0390 | .199 | 7 | .318 |
| .072 | 49 | .0420 | .201 | 6 | .321 |
| .075 | 48 | .0450 | .2031 | 13/64 | .327 |
| .077 | 47 | .0480 | .204 | 5 | .327 |
| .0781 | 5/64 | .0510 | .207 | 4 | .345 |
| .079 | 46 | .0510 | .212 | 3 | .363 |
| .081 | 45 | .0540 | .2187 | *7/32 | .387 |
| .085 | 44 | .0570 | .219 | 2 | .387 |
| .088 | 43 | .0630 | .227 | 1 | .414 |
| .092 | 42 | .069 | .234 | A | .441 |
| .0937 | 3/32 | .069 | .2343 | 15/64 | .441 |
| .095 | 41 | .072 | .238 | B | .450 |
| .097 | 40 | .075 | .242 | C | .462 |
| .099 | 39 | .078 | .246 | D | .483 |
| .101 | 38 | .084 | .250 | *1/4 | .501 |
| .103 | 37 | .087 | .257 | F | .522 |
| .106 | 36 | .090 | .261 | G | .543 |
| .108 | 35 | .093 | .2656 | 17/64 | .561 |
| .1093 | 7/64 | .093 | .272 | I | .594 |
| .110 | 34 | .096 | .277 | J | .615 |
| .112 | 33 | .102 | .281 | K | .636 |
| .115 | 32 | .108 | .2812 | *9/32 | .639 |
| .120 | 31 | .117 | .290 | L | .675 |
| .125 | *1/8 | .126 | .2968 | 19/64 | .702 |
| .127 | 30 | .129 | .302 | N | .726 |
| .134 | 29 | .144 | .3125 | *5/16 | .780 |
| .139 | 28 | .156 | .316 | O | .813 |
| .1406 | 9/64 | .156 | .323 | P | .831 |
| .143 | 27 | .165 | .3281 | 21/64 | .861 |
| .146 | 26 | .171 | .3437 | 11/32 | .939 |
| .148 | 25 | .177 | .358 | T | 1.026 |
| .151 | 24 | .183 | .3593 | 23/64 | 1.032 |
| .153 | 23 | .189 | .375 | *3/8 | 1.125 |
| .155 | 22 | .195 | .377 | V | 1.149 |
| .1562 | *5/32 | .198 | .386 | W | 1.200 |
| .157 | 21 | .198 | .3906 | 25/64 | 1.221 |
| .161 | 20 | .207 | .397 | X | 1.263 |
| .164 | 19 | .216 | .4062 | 13/32 | 1.311 |
| .168 | 18 | .228 | .4218 | 27/64 | 1.416 |
| .1718 | 11/64 | .234 | .4375 | *7/16 | 1.530 |
| .172 | 17 | .237 | .4531 | 29/64 | 1.626 |
| .175 | 16 | .246 | .4687 | 15/32 | 1.749 |
| .178 | 15 | .255 | .4843 | 31/64 | 1.875 |
| .180 | 14 | .261 | .500 | *1/2 | 2.001 |
| .182 | 13 | .267 | .5156 | 33/64 | 2.127 |
| .185 | 12 | .276 | .5312 | 17/32 | 2.250 |
| .1875 | *3/16 | .282 | | | |

(Continued)

## CARBON STEEL DRILL ROD, *Continued*

### POLISHED ROUNDS



*Guaranteed free from surface decarburization*

3 Foot Lengths: Sizes marked * also carried in 12 Foot Lengths

| Decimal Diam. | Size | Wt. per 3 Ft. Piece in Lbs. | Decimal Diam. | Size | Wt. per 3 Ft. Piece in Lbs. |
|---|---|---|---|---|---|
| (*Continued*) | | | | | |
| .5468 | 35/64 | 2.391 | .9062 | 29/32 | 6.564 |
| .5625 | *9/16 | 2.532 | .9218 | 59/64 | 6.786 |
| .5937 | 19/32 | 2.811 | .9375 | 15/16 | 6.999 |
| .6093 | 39/64 | 3.000 | .9531 | 61/64 | 7.248 |
| .625 | *5/8 | 3.126 | .9687 | 31/32 | 7.593 |
| .6406 | 41/64 | 3.312 | .9843 | 63/64 | 7.749 |
| .6562 | 21/32 | 3.435 | 1.000 | *1 | 7.998 |
| .6875 | 11/16 | 3.750 | 1.0625 | 1 1/16 | 9.030 |
| .7031 | 45/64 | 3.936 | 1.125 | 1 1/8 | 10.125 |
| .7187 | 23/32 | 4.125 | 1.1875 | 1 3/16 | 11.313 |
| .750 | *3/4 | 4.500 | 1.250 | *1 1/4 | 12.501 |
| .7656 | 49/64 | 4.686 | 1.3125 | 1 5/16 | 13.800 |
| .7812 | 25/32 | 4.875 | 1.3750 | 1 3/8 | 15.147 |
| .8125 | 13/16 | 5.250 | 1.4375 | 1 7/16 | 16.536 |
| .8281 | 53/64 | 5.484 | 1.500 | *1 1/2 | 18.000 |
| .8437 | 27/32 | 5.688 | 1.625 | 1 5/8 | 21.15 |
| .875 | *7/8 | 6.126 | 1.750 | 1 3/4 | 24.51 |
| .8906 | 57/64 | 6.354 | 2.000 | 2 | 32.04 |

### SQUARES—Lime Drawn Quality

3 Foot Lengths

| | | | | | |
|---|---|---|---|---|---|
| 3/32 | .0937 | .090 | 7/16 | .4375 | 1.953 |
| 1/8 | .125 | .159 | 1/2 | .500 | 2.550 |
| 5/32 | .1562 | .249 | 5/8 | .625 | 3.984 |
| 3/16 | .1875 | .360 | 3/4 | .750 | 5.739 |
| 1/4 | .250 | .636 | 7/8 | .875 | 7.809 |
| 5/16 | .3125 | .996 | 1 | 1.000 | 10.200 |
| 3/8 | .375 | 1.434 | | | |

### FLATS—Lime Drawn Quality

3 Foot Lengths

| Size in Inches | | Wt. per Ft. in Lbs. | Wt. per 3 Ft. Piece in Lbs. | Size in Inches | | Wt. per Ft. in Lbs. | Wt. per 3 Ft. Piece in Lbs. |
|---|---|---|---|---|---|---|---|
| 1/16 x | 1/8 | .027 | .081 | 3/16 x | 3/8 | .398 | 1.194 |
| | 1/4 | .053 | .159 | | 3/4 | .478 | 1.434 |
| | 3/8 | .080 | .240 | | 1 | .638 | 1.914 |
| | 1/2 | .106 | .318 | 1/4 x | 5/16 | .266 | .798 |
| 3/32 x | 3/16 | .060 | .180 | | 3/8 | .319 | .957 |
| | 1/4 | .080 | .240 | | 1/2 | .425 | 1.275 |
| | 1/2 | .159 | .477 | | 5/8 | .531 | 1.593 |
| 1/8 x | 3/16 | .080 | .240 | | 3/4 | .638 | 1.914 |
| | 1/4 | .106 | .318 | | 1 | .850 | 2.550 |
| | 3/8 | .159 | .477 | 5/16 x | 3/8 | .398 | 1.194 |
| | 1/2 | .213 | .639 | | 1/2 | .531 | 1.593 |
| | 5/8 | .266 | .798 | | 1 | 1.060 | 3.180 |
| | 1 | .425 | 1.275 | 3/8 x | 5/8 | .797 | 2.391 |
| 5/32 x | 3/8 | .199 | .597 | | 3/4 | .956 | 2.868 |
| 3/16 x | 1/4 | .159 | .477 | | 1 | 1.275 | 3.825 |
| | 5/16 | .199 | .597 | 1/2 x | 3/4 | 1.275 | 3.825 |
| | 3/8 | .239 | .717 | | 1 | 1.700 | 5.100 |
| | 1/2 | .319 | .957 | | | | |

## COMPARISON OF PIPE AND TUBING SIZES

**Comparison of Pipe Sizes With Nearest Cold Drawn Seamless Mech. Tubing Sizes Available from Stock**

### STANDARD SIZES

| Nominal Pipe Size | Actual Pipe Size in Decimal Inches | | Nearest Fractional Sizes Available in Cold Drawn Seamless Tubing | | | |
|---|---|---|---|---|---|---|
| | O.D. | Wall | O.D. | (Decimals) | Wall | (Decimals) |
| ⅛ | .405 | .068 | 13/32 | ( .406 ) | 16 | (.065) |
| ¼ | .540 | .088 | 17/32 | ( .531 ) | 14 | (.083) |
| ⅜ | .675 | .091 | 21/32 | ( .656 ) | 13 | (.095) |
| ½ | .840 | .109 | 27/32 | ( .844 ) | 12 | (.109) |
| ¾ | 1.050 | .113 | 1 1/16 | (1.0625) | 12 | (.109) |
| 1 | 1.315 | .133 | 1 5/16 | (1.313 ) | 10 | (.134) |
| 1 ¼ | 1.660 | .140 | 1 5/8 | (1.625 ) | 5/32 | (.156) |
| 1 ½ | 1.900 | .145 | 1 7/8 | (1.875 ) | 5/32 | (.156) |
| 2 | 2.375 | .154 | 2 3/8 | (2.375 ) | 5/32 | (1.56) |
| 2 ½ | 2.875 | .203 | 2 7/8 | (2.875 ) | 7/32 | (.219) |
| 3 | 3.500 | .216 | 3 ½ | (3.500 ) | 7/32 | (.219) |
| 3 ½ | 4.000 | .226 | 4 | (4.000 ) | ¼ | (.250) |
| 4 | 4.500 | .237 | 4 ½ | (4.500 ) | ¼ | (.250) |
| 4 ½ | 5.000 | .247 | 5 | (5.000 ) | ¼ | (.250) |
| 5 | 5.563 | .258 | 5 5/8 | (5.625 ) | 5/16 | (.313) |
| 6 | 6.625 | .280 | 6 5/8 | (6.625 ) | 5/16 | (.313) |

### EXTRA STRONG SIZES

| Nominal Pipe Size | Actual Pipe Size in Decimal Inches | | Nearest Fractional Sizes Available in Cold Drawn Seamless Tubing | | | |
|---|---|---|---|---|---|---|
| | O.D. | Wall | O.D. | (Decimals) | Wall | (Decimals) |
| ⅛ | .405 | .095 | 13/32 | ( .406 ) | 13 | (.095) |
| ¼ | .540 | .119 | 17/32 | ( .531 ) | 11 | (.120) |
| ⅜ | .675 | .126 | 21/32 | ( .656 ) | 11 | (.120) |
| ½ | .840 | .147 | 27/32 | ( .844 ) | 9 | (.148) |
| ¾ | 1.050 | .154 | 1 1/16 | (1.0625) | 5/32 | (.156) |
| 1 | 1.315 | .179 | 1 5/16 | (1.313 ) | 3/16 | (.187) |
| 1 ¼ | 1.660 | .191 | 1 5/8 | (1.625 ) | 3/16 | (.187) |
| 1 ½ | 1.900 | .200 | 1 7/8 | (1.875 ) | 7/32 | (.219) |
| 2 | 2.375 | .218 | 2 3/8 | (2.375 ) | 7/32 | (.219) |
| 2 ½ | 2.875 | .276 | 2 7/8 | (2.875 ) | 9/32 | (.281) |
| 3 | 3.500 | .300 | 3 ½ | (3.500 ) | 5/16 | (.313) |
| 3 ½ | 4.000 | .318 | 4 | (4.000 ) | 5/16 | (.313) |
| 4 | 4.500 | .337 | 4 ½ | (4.500 ) | 5/16 | (.313) |
| 4 ½ | 5.000 | .355 | 5 | (5.000 ) | ⅜ | (.375) |
| 5 | 5.563 | .375 | 5 5/8 | (5.625 ) | ⅜ | (.375) |
| 6 | 6.625 | .432 | 6 5/8 | (6.625 ) | ⅜ | (.375) |

### DOUBLE EXTRA STRONG

| Nominal Pipe Size | Actual Pipe Size in Decimal Inches | | Nearest Fractional Sizes Available in Cold Drawn Seamless Tubing | | | |
|---|---|---|---|---|---|---|
| | O.D. | Wall | O.D. | (Decimals) | Wall | (Decimals) |
| ½ | .840 | .294 | ⅞ | ( .875 ) | 5/16 | (.313) |
| ¾ | 1.050 | .308 | 1 1/16 | (1.0625) | 5/16 | (.313) |
| 1 | 1.315 | .358 | 1 5/16 | (1.313 ) | ⅜ | (.375) |
| 1 ¼ | 1.660 | .382 | 1 5/8 | (1.625 ) | ⅜ | (.375) |
| 1 ½ | 1.900 | .400 | 1 7/8 | (1.875 ) | 7/16 | (.438) |
| 2 | 2.375 | .436 | 2 3/8 | (2.375 ) | 7/16 | (.438) |
| 2 ½ | 2.875 | .552 | 2 7/8 | (2.875 ) | 9/16 | (.563) |
| 3 | 3.500 | .600 | 3 ½ | (3.500 ) | 9/16 | (.563) |
| 3 ½ | 4.000 | .636 | 4 | (4.000 ) | ⅝ | (.625) |
| 4 | 4.500 | .674 | 4 ½ | (4.500 ) | 11/16 | (.688) |
| 4 ½ | 5.000 | .710 | 5 | (5.000 ) | ¾ | (.750) |

# *Tubing*


**SEAMLESS MECHANICAL (ROUND)**

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.40 to .50 Carbon . . . . . 147
Special Drawn to
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**WELDED MECHANICAL (ROUND)**

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Hot Rolled Bright Finish . . . . . 148

**HYDRAULIC CYLINDER and FLUID LINE**

Rockrite Superior Cylinder Finish . . . . . 145
Cold Drawn Welded Cylinder . . . . . 146
Special Drawn to
O.D. and I.D. dimensions . . . . . 146
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**BLACK PIPE**

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**TOLERANCES**

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## SEAMLESS MECHANICAL TUBING
### ROUND—COLD DRAWN—LOW CARBON

**MT 1015**

All Ryerson tubing meets standards of straightness, concentricity and size accuracy that equal or surpass standard tolerances. Ryerson tubing can be formed and is readily machined or welded.

Many times you can realize substantial savings by using tubing instead of bar stock. We supply both shapes and invite you to consult with our tubing and bar specialists who will help determine the best choice for your needs. Your inquiries and orders will always receive prompt, personal attention.

**Random Lengths: 5 to 24 Ft.**

| Size O.D. | Average Wall B.W. Ga. | Average Wall Dec. Inches | Nominal I.D. | Wt. Per Ft. in Lbs. |
|---|---|---|---|---|
| 3/16 | | | | |
| | 24 | .022 | .144 | .0390 |
| | *22 | .028 | .131 | .0478 |
| | 21 | .032 | .123 | .0533 |
| | *20 | .035 | .117 | .0572 |
| | 18 | .049 | .089 | .0727 |
| | 17 | .058 | .072 | .0805 |
| | 16 | .065 | .058 | .0854 |
| 1/4 | | | | |
| | 24 | .022 | .206 | .0536 |
| | 22 | .028 | .194 | .0664 |
| | 21 | .032 | .187 | .0745 |
| | *20 | .035 | .180 | .0804 |
| | *18 | .049 | .152 | .1052 |
| | 17 | .058 | .132 | .1189 |
| | 16 | .065 | .120 | .1284 |
| | 14 | .083 | .084 | .1480 |
| | 13 | .095 | .060 | .1573 |
| 5/16 | | | | |
| | 24 | .022 | .268 | .0684 |
| | 22 | .028 | .256 | .0852 |
| | 21 | .032 | .249 | .0960 |
| | *20 | .035 | .242 | .1039 |
| | 19 | .042 | .229 | .1216 |
| | 18 | .049 | .214 | .1382 |
| | 17 | .058 | .196 | .1580 |
| | 16 | .065 | .182 | .1722 |
| | 14 | .083 | .147 | .2039 |
| | 13 | .095 | .122 | .2212 |
| 3/8 | | | | |
| | 24 | .022 | .331 | .0829 |
| | 23 | .025 | .325 | .0935 |
| | 22 | .028 | .319 | .1038 |
| | 21 | .032 | .311 | .1172 |
| | *20 | .035 | .305 | .1271 |
| | 19 | .042 | .291 | .1494 |
| | *18 | .049 | .277 | .1706 |
| | 17 | .058 | .259 | .1964 |
| | *16 | .065 | .245 | .2152 |
| | 14 | .083 | .209 | .2585 |
| | 13 | .095 | .185 | .2841 |
| | 12 | .109 | .157 | .3097 |
| | 11 | .120 | .135 | .3268 |

| Size O.D. | Average Wall B.W. Ga. | Average Wall Dec. Inches | Nominal I.D. | Wt. Per Ft. in Lbs. |
|---|---|---|---|---|
| 3/8 | | | | |
| | 10 | .134 | .107 | .3449 |
| 13/32 | | | | |
| | 16 | .065 | .276 | .2367 |
| | 13 | .095 | .216 | .3155 |
| 7/16 | | | | |
| | 23 | .025 | .388 | .1103 |
| | 22 | .028 | .381 | .1226 |
| | 21 | .032 | .374 | .1388 |
| | 20 | .035 | .367 | .1506 |
| | *18 | .049 | .340 | .2036 |
| | 17 | .058 | .322 | .2354 |
| | *16 | .065 | .307 | .2589 |
| | 14 | .083 | .272 | .3147 |
| | 13 | .095 | .247 | .3480 |
| | 11 | .120 | .197 | .4075 |
| | 10 | .134 | .169 | .4351 |
| 1/2 | | | | |
| | 24 | .022 | .456 | .1123 |
| | 22 | .028 | .444 | .1411 |
| | 21 | .032 | .436 | .1599 |
| | *20 | .035 | .430 | .1738 |
| | *18 | .049 | .402 | .2360 |
| | 17 | .058 | .384 | .2738 |
| | *16 | .065 | .370 | .3020 |
| | 15 | .072 | .356 | .3291 |
| | 14 | .083 | .334 | .3696 |
| | 13 | .095 | .310 | .4109 |
| | 12 | .109 | .282 | .4552 |
| | 11 | .120 | .260 | .4870 |
| | 10 | .134 | .232 | .5238 |
| | 9/32 | .156 | .187 | .5731 |
| | 3/16 | .187 | .125 | .6264 |
| 17/32 | | | | |
| | 16 | .065 | .401 | .3237 |
| | 14 | .083 | .365 | .3871 |
| 9/16 | | | | |
| | 22 | .028 | .506 | .1600 |
| | 20 | .035 | .492 | .1974 |
| | 18 | .049 | .464 | .2690 |
| | 16 | .065 | .432 | .3457 |
| | 14 | .083 | .396 | .4255 |

(Continued)

* Also carried in Cold Drawn Seamless Hydraulic Fluid Line Tubing.

## SEAMLESS MECHANICAL TUBING

*(Continued)*

| Size O.D. | Average Wall B.W. Ga. | Average Wall Dec. Inches | Nominal I.D. | Wt. Per Ft. in Lbs. |
|---|---|---|---|---|
| 9/16 | | | | |
| | 13 | .095 | .372 | .4748 |
| | 12 | .109 | .344 | .5285 |
| | 11 | .120 | .322 | .5677 |
| | 10 | .134 | .295 | .6140 |
| | 5/32 | .156 | .250 | .6781 |
| | 3/16 | .188 | .188 | .7529 |
| 5/8 | | | | |
| | 22 | .028 | .569 | .1785 |
| | 21 | .032 | .561 | .2027 |
| | *20 | .035 | .555 | .2205 |
| | *18 | .049 | .527 | .3014 |
| | 17 | .058 | .509 | .3512 |
| | *16 | .065 | .495 | .3888 |
| | 14 | .083 | .459 | .4805 |
| | 13 | .095 | .435 | .5377 |
| | 12 | .109 | .407 | .6007 |
| | 11 | .120 | .385 | .6472 |
| | 10 | .134 | .357 | .7027 |
| | 5/32 | .156 | .312 | .7814 |
| | 3/16 | .188 | 250 | 8774 |
| | 7/32 | .219 | .187 | .9496 |
| | 1/4 | .250 | .125 | 1.001 |
| 21/32 | | | | |
| | 13 | .095 | .466 | .5692 |
| 11/16 | | | | |
| | 20 | .035 | .617 | .2441 |
| | 18 | .049 | .589 | .3344 |
| | 16 | .065 | .557 | .4325 |
| | 14 | .083 | .521 | .5363 |
| | 13 | .095 | .497 | .6017 |
| | 12 | .109 | .469 | .6740 |
| | 11 | .120 | .447 | .7279 |
| | 10 | .134 | .419 | .7928 |
| | 5/32 | .156 | .375 | .8864 |
| | 3/16 | .188 | .312 | 1.004 |
| 3/4 | | | | |
| | 24 | .022 | .706 | .1711 |
| | 22 | .028 | .694 | .2159 |
| | *20 | .035 | .680 | .2673 |
| | *18 | .049 | .652 | .3668 |
| | 17 | .058 | .634 | .4286 |
| | *16 | .065 | .620 | .4755 |
| | 14 | .083 | .584 | .5913 |
| | *13 | .095 | .560 | .6646 |
| | 12 | .109 | .532 | .7462 |
| | 11 | .120 | .510 | .8074 |
| | 10 | .134 | .482 | .8816 |
| | 5/32 | .156 | .437 | .9897 |
| | 3/16 | .188 | .375 | 1.128 |
| | 7/32 | .219 | .313 | 1.242 |
| | 1/4 | .250 | .250 | 1.335 |
| 13/16 | | | | |
| | 20 | .035 | .742 | .2908 |
| | *16 | .065 | .682 | .5193 |
| | 14 | .083 | .647 | .6471 |
| | 13 | .095 | .622 | .7285 |
| | 11 | .120 | .572 | .8881 |
| 13/16 | | | | |
| | 10 | .134 | .544 | .9717 |
| | 5/32 | .156 | .500 | 1.095 |
| | 3/16 | .188 | .437 | 1.255 |
| | 7/32 | .219 | .375 | 1.389 |
| | 1/4 | .250 | .312 | 1.503 |
| 27/32 | | | | |
| | 12 | .109 | .626 | .8556 |
| 7/8 | | | | |
| | 22 | .028 | .819 | .2533 |
| | 20 | .035 | .805 | .3140 |
| | *18 | .049 | .777 | .4323 |
| | 17 | .058 | .759 | .5061 |
| | *16 | .065 | .745 | .5623 |
| | 14 | .083 | .709 | .7021 |
| | 13 | .095 | .685 | .7914 |
| | 12 | .109 | .657 | .8917 |
| | 11 | .120 | .635 | .9676 |
| | 10 | .134 | .607 | 1.060 |
| | 5/32 | .156 | .562 | 1.198 |
| | 3/16 | .188 | .500 | 1.379 |
| | 7/32 | .219 | .437 | 1.534 |
| | 1/4 | .250 | .375 | 1.669 |
| | 5/16 | .313 | .250 | 1.879 |
| 15/16 | | | | |
| | 18 | .049 | .839 | .4652 |
| | 17 | .058 | .822 | .5451 |
| | 16 | .065 | .807 | .6060 |
| | 14 | .083 | .772 | .7579 |
| | 13 | .095 | .748 | .8553 |
| | 11 | .120 | .697 | 1.048 |
| | 10 | .134 | .669 | 1.151 |
| | 5/32 | .156 | .625 | 1.303 |
| | 3/16 | .188 | .562 | 1.506 |
| | 7/32 | .219 | .500 | 1.682 |
| | 1/4 | .250 | .438 | 1.837 |
| 1 | | | | |
| | 24 | .022 | .956 | .2298 |
| | 22 | .028 | .944 | .2907 |
| | 21 | .032 | .936 | 3308 |
| | 20 | .035 | .930 | .3607 |
| | *18 | .049 | .902 | .4977 |
| | 17 | .058 | .884 | .5835 |
| | *16 | .065 | .870 | .6491 |
| | 14 | .083 | .834 | .8129 |
| | 13 | .095 | .810 | .9182 |
| | 12 | .109 | .782 | 1.037 |
| | 11 | .120 | .760 | 1.128 |
| | 10 | .134 | .732 | 1.239 |
| | 5/32 | .156 | .687 | 1.406 |
| | 3/16 | .188 | .625 | 1.630 |
| | 7/32 | .219 | .562 | 1.827 |
| | 1/4 | .250 | .500 | 2.003 |
| | 9/32 | .281 | .438 | 2.158 |
| | 5/16 | .313 | .375 | 2.297 |
| | 3/8 | .375 | .250 | 2.503 |

*(Continued)*

*Also carried in Cold Drawn Seamless Hydraulic Fluid Line Tubing.

## SEAMLESS MECHANICAL TUBING

*(Continued)*

| Size O.D. | Average Wall B.W. Ga. | Average Wall Dec. Inches | Nominal I.D. | Wt. Per Ft. in Lbs. |
|---|---|---|---|---|
| **1 1/16** | | | | |
| | 20 | .035 | .992 | .3843 |
| | 18 | .049 | .964 | .5306 |
| | 17 | .058 | .946 | .6225 |
| | 16 | .065 | .932 | .6928 |
| | 14 | .083 | .897 | .8687 |
| | 13 | .095 | .872 | .9821 |
| | 12 | .109 | .844 | 1.111 |
| | 11 | .120 | .822 | 1.209 |
| | 10 | .134 | .795 | 1.330 |
| | 5/32 | .156 | .750 | 1.511 |
| | 3/16 | .188 | .687 | 1.757 |
| | 7/32 | .219 | .625 | 1.974 |
| | 1/4 | .250 | .562 | 2.171 |
| | 9/32 | .281 | .500 | 2.347 |
| | 5/16 | .313 | .437 | 2.507 |
| | 3/8 | .375 | .312 | 2.755 |
| **1 1/8** | | | | |
| | 20 | .035 | 1.055 | .4074 |
| | 18 | .049 | 1.027 | .5631 |
| | 17 | .058 | 1.009 | .6609 |
| | 16 | .065 | .995 | .7359 |
| | 14 | .083 | .959 | .9237 |
| | *13 | .095 | .935 | 1.045 |
| | 12 | .109 | .907 | 1.183 |
| | 11 | .120 | .885 | 1.288 |
| | 10 | .134 | .857 | 1.418 |
| | 5/32 | .156 | .812 | 1.614 |
| | 3/16 | .188 | .750 | 1.881 |
| | 7/32 | .219 | .688 | 2.119 |
| | 1/4 | .250 | .625 | 2.336 |
| | 9/32 | .281 | .563 | 2.533 |
| | 5/16 | .313 | .500 | 2.714 |
| | 3/8 | .375 | .375 | 3.004 |
| **1 3/16** | | | | |
| | 20 | .035 | 1.117 | .4310 |
| | 18 | .049 | 1.090 | .5961 |
| | 16 | .065 | 1.057 | .7796 |
| | 14 | .083 | 1.022 | .9795 |
| | 13 | .095 | .997 | 1.109 |
| | 11 | .120 | .947 | 1.369 |
| | 5/32 | .156 | .875 | 1.719 |
| | 3/16 | .188 | .812 | 2.008 |
| | 7/32 | .219 | .750 | 2.266 |
| | 1/4 | .250 | .687 | 2.504 |
| | 5/16 | .313 | .562 | 2.925 |
| **1 1/4** | | | | |
| | 22 | .028 | 1.194 | .3654 |
| | 21 | .032 | 1.186 | .4163 |
| | 20 | .035 | 1.180 | .4542 |
| | 18 | .049 | 1.152 | .6285 |
| | 17 | .053 | 1.134 | .7384 |
| | *16 | .065 | 1.120 | .8226 |
| | 14 | .083 | 1.084 | 1.034 |
| | *13 | .095 | 1.060 | 1.172 |
| | 12 | .109 | 1.032 | 1.328 |
| **1 1/4** | | | | |
| | 11 | .120 | 1.010 | 1.448 |
| | 10 | .134 | .982 | 1.597 |
| | 5/32 | .156 | .937 | 1.823 |
| | 3/16 | 188 | 875 | 2.132 |
| | 7/32 | .219 | .812 | 2.411 |
| | 1/4 | .250 | .750 | 2.670 |
| | 9/32 | .281 | .687 | 2.908 |
| | 5/16 | .313 | .625 | 3.132 |
| | 3/8 | .375 | .500 | 3.504 |
| | 7/16 | .437 | .375 | 3.798 |
| **1 5/16** | | | | |
| | 20 | .035 | 1.242 | .4777 |
| | 16 | .065 | 1.182 | .8664 |
| | 14 | .083 | 1.147 | 1.090 |
| | 13 | .095 | 1.122 | 1.236 |
| | 11 | .120 | 1.072 | 1.529 |
| | 10 | .134 | 1.044 | 1.687 |
| | 5/32 | .156 | 1.000 | 1.928 |
| | 3/16 | .188 | .937 | 2.259 |
| | 7/32 | .219 | .875 | 2.559 |
| | 1/4 | .250 | .812 | 2.838 |
| | 9/32 | .281 | .750 | 3.097 |
| | 5/16 | .313 | .688 | 3.343 |
| | 3/8 | .375 | .562 | 3.757 |
| **1 3/8** | | | | |
| | 20 | .035 | 1.305 | .5009 |
| | 18 | .049 | 1.277 | .6939 |
| | 16 | .065 | 1.245 | .9094 |
| | 14 | .083 | 1.209 | 1.145 |
| | 13 | .095 | 1.185 | 1.299 |
| | 12 | .109 | 1.157 | 1.474 |
| | 11 | .120 | 1.135 | 1.608 |
| | 10 | .134 | 1.107 | 1.776 |
| | 5/32 | .156 | 1.062 | 2.031 |
| | 3/16 | .188 | 1.000 | 2.383 |
| | 7/32 | .219 | .938 | 2.704 |
| | 1/4 | .250 | .875 | 3.004 |
| | 9/32 | .281 | .813 | 3.283 |
| | 5/16 | .313 | .750 | 3.550 |
| | 3/8 | .375 | .625 | 4.005 |
| | 7/16 | .438 | .500 | 4.383 |
| | 1/2 | .500 | .375 | 4.673 |
| **1 7/16** | | | | |
| | 20 | .035 | 1.367 | .5244 |
| | 18 | .049 | 1.339 | .7269 |
| | 16 | .065 | 1.307 | .9531 |
| | 14 | .083 | 1.271 | 1.201 |
| | 13 | .095 | 1.248 | 1.363 |
| | 11 | 120 | 1.198 | 1.689 |
| | 10 | .134 | 1.170 | 1.866 |
| | 5/32 | .156 | 1.125 | 2.136 |
| | 3/16 | .188 | 1.062 | 2.510 |
| | 7/32 | .219 | 1.000 | 2.851 |
| | 1/4 | .250 | .938 | 3.172 |
| | 1/2 | .500 | .438 | 5.009 |

*(Continued)*

* Also carried in Cold Drawn Seamless Hydraulic Fluid Line Tubing.

## SEAMLESS MECHANICAL TUBING

*(Continued)*

| Size O.D. | Average Wall B.W. Ga. | Average Wall Dec. Inches | Nominal I.D. | Wt. Per Ft. in Lbs. |
|---|---|---|---|---|
| **1½** | | | | |
| | 22 | .028 | 1.444 | .4402 |
| | 20 | .035 | 1.430 | .5476 |
| | 18 | .049 | 1.402 | .7593 |
| | 17 | .058 | 1.384 | .8932 |
| | *16 | .065 | 1.370 | .9962 |
| | 14 | .083 | 1.334 | 1.256 |
| | *13 | .095 | 1.310 | 1.426 |
| | 12 | .109 | 1.282 | 1.619 |
| | 11 | .120 | 1.260 | 1.769 |
| | 10 | .134 | 1.232 | 1.955 |
| | 5/32 | .156 | 1.187 | 2.239 |
| | 3/16 | .188 | 1.125 | 2.634 |
| | 7/32 | .219 | 1.062 | 2.996 |
| | 1/4 | 250 | 1 000 | 3.338 |
| | 9/32 | .281 | .938 | 3.658 |
| | 5/16 | .313 | .875 | 3.968 |
| | 3/8 | .375 | .750 | 4.506 |
| | 7/16 | .438 | .625 | 4.968 |
| | 1/2 | .500 | .500 | 5.340 |
| **1 9/16** | | | | |
| | 16 | .065 | 1.432 | 1.040 |
| | 13 | .095 | 1.373 | 1.489 |
| | 11 | .120 | 1.323 | 1.849 |
| | 10 | .134 | 1.295 | 2.045 |
| | 5/32 | .156 | 1.250 | 2.344 |
| | 3/16 | .187 | 1.187 | 2.761 |
| | 1/4 | .250 | 1.062 | 3.506 |
| | 3/8 | .375 | .812 | 4.758 |
| **1⅝** | | | | |
| | 20 | .035 | 1.555 | .5943 |
| | 18 | .049 | 1.527 | .8248 |
| | 17 | .058 | 1.509 | .9707 |
| | 16 | .065 | 1.495 | 1.083 |
| | 14 | .083 | 1.459 | 1.367 |
| | 13 | .095 | 1.435 | 1.552 |
| | 11 | .120 | 1.385 | 1.929 |
| | 10 | .134 | 1.357 | 2.134 |
| | 5/32 | .156 | 1.312 | 2.447 |
| | 3/16 | .188 | 1.250 | 2.885 |
| | 7/32 | .219 | 1.187 | 3.289 |
| | 1/4 | .250 | 1.125 | 3.671 |
| | 9/32 | .281 | 1.063 | 4.033 |
| | 5/16 | .313 | 1.000 | 4.386 |
| | 3/8 | .375 | .875 | 5.006 |
| | 7/16 | .438 | .749 | 5.553 |
| | 1/2 | .500 | .625 | 6.008 |
| **1 11/16** | | | | |
| | 16 | .065 | 1.558 | 1.127 |
| | 11 | .120 | 1.447 | 2.010 |
| | 5/32 | .156 | 1.376 | 2.552 |
| | 3/16 | .187 | 1.312 | 3.012 |
| | 1/4 | .250 | 1.188 | 3.839 |
| **1¾** | | | | |
| | 18 | .049 | 1.652 | .8902 |
| | 16 | .065 | 1.620 | 1.170 |
| | 14 | .083 | 1.584 | 1.478 |
| | 13 | .095 | 1.560 | 1.679 |
| | 12 | .109 | 1.532 | 1.910 |
| | 11 | .120 | 1.510 | 2.089 |
| | 10 | .134 | 1.482 | 2.313 |
| | 5/32 | .156 | 1.437 | 2.656 |
| | 3/16 | .188 | 1.375 | 3.136 |
| | 7/32 | .219 | 1.312 | 3.581 |
| | 1/4 | .250 | 1.250 | 4.005 |
| | 9/32 | .281 | 1.188 | 4.409 |
| | 5/16 | .313 | 1.125 | 4.804 |
| | 3/8 | .375 | 1.000 | 5.507 |
| | 7/16 | .438 | .875 | 6.137 |
| | 1/2 | .500 | .750 | 6.675 |
| | 9/16 | .563 | .625 | 7.137 |
| | 5/8 | .625 | .500 | 7.509 |
| **1 13/16** | | | | |
| | 3/16 | .188 | 1.439 | 3.263 |
| | 7/32 | .219 | 1.375 | 3.728 |
| | 1/4 | .250 | 1.313 | 4.173 |
| **1⅞** | | | | |
| | 16 | .065 | 1.745 | 1.257 |
| | 13 | .095 | 1.685 | 1.806 |
| | 12 | .109 | 1.657 | 2.056 |
| | 11 | .120 | 1.635 | 2.249 |
| | 5/32 | .156 | 1.563 | 2.864 |
| | 3/16 | .188 | 1.500 | 3.387 |
| | 7/32 | .219 | 1.438 | 3.873 |
| | 1/4 | .250 | 1.375 | 4.339 |
| | 9/32 | .281 | 1.313 | 4.784 |
| | 5/16 | .313 | 1.250 | 5.222 |
| | 3/8 | .375 | 1.125 | 6.008 |
| | 7/16 | .437 | 1.000 | 6.722 |
| | 1/2 | .500 | .875 | 7.343 |
| | 9/16 | .563 | .750 | 7.889 |
| **1 15/16** | | | | |
| | 5/32 | .156 | 1.625 | 2.969 |
| | 7/32 | .219 | 1.499 | 4.021 |
| | 1/4 | .250 | 1.437 | 4.507 |
| **2** | | | | |
| | 20 | .035 | 1.930 | .7345 |
| | 18 | .049 | 1.902 | 1.021 |
| | 16 | .065 | 1.870 | 1.343 |
| | 14 | .083 | 1.834 | 1.699 |
| | 13 | .095 | 1.810 | 1.933 |
| | 12 | .109 | 1.782 | 2.201 |
| | 11 | .120 | 1.760 | 2.409 |
| | 10 | .134 | 1.732 | 2.670 |
| | 5/32 | 156 | 1 687 | 3.072 |
| | 3/16 | .188 | 1.625 | 3.638 |
| | 7/32 | .219 | 1.562 | 4.166 |
| | †1/4 | .250 | 1.500 | 4.673 |
| | 9/32 | .281 | 1.437 | 5.159 |
| | 5/16 | .313 | 1.375 | 5.639 |
| | 11/32 | .344 | 1.313 | 6.084 |

*(Continued)*

* Also carried in Cold Drawn Seamless Hydraulic Fluid Line Tubing.
† Also drawn to O.D.-I.D. dimensions.

## SEAMLESS MECHANICAL TUBING

*(Continued)*

| Size O.D. | Average Wall B.W. Ga. | Average Wall Dec. Inches | Nominal I.D. | Wt. Per Ft. in Lbs. |
|---|---|---|---|---|
| **2** | | | | |
| | 3/8 | .375 | 1.250 | 6.508 |
| | 7/16 | .438 | 1.125 | 7.307 |
| | 1/2 | .500 | 1.000 | 8.010 |
| | 9/16 | .563 | .874 | 8.640 |
| | 5/8 | .625 | .750 | 9.178 |
| | 3/4 | .750 | .500 | 10.01 |
| **2 1/8** | | | | |
| | 18 | .049 | 2.027 | 1.086 |
| | 16 | .065 | 1.995 | 1.430 |
| | 14 | .083 | 1.959 | 1.810 |
| | 13 | .095 | 1.935 | 2.060 |
| | 11 | .120 | 1.885 | 2.570 |
| | 5/32 | .156 | 1.813 | 3.281 |
| | 3/16 | .188 | 1.750 | 3.889 |
| | 7/32 | .219 | 1.687 | 4.458 |
| | 1/4 | .250 | 1.625 | 5.006 |
| | 9/32 | .281 | 1.563 | 5.534 |
| | 5/16 | .313 | 1.500 | 6.057 |
| | 3/8 | .375 | 1.375 | 7.009 |
| | 7/16 | .438 | 1.250 | 7.892 |
| | 1/2 | .500 | 1.125 | 8.678 |
| | 9/16 | .562 | 1.000 | 9.392 |
| | 5/8 | .625 | .875 | 10.01 |
| **2 1/4** | | | | |
| | 20 | .035 | 2.180 | .8280 |
| | 16 | .065 | 2.120 | 1.517 |
| | 14 | .083 | 2.084 | 1.921 |
| | 13 | .095 | 2.060 | 2.186 |
| | 11 | .120 | 2.010 | 2.730 |
| | 5/32 | .156 | 1.937 | 3.489 |
| | 3/16 | .188 | 1.875 | 4.140 |
| | 7/32 | .219 | 1.813 | 4.750 |
| | †1/4 | .250 | 1.750 | 5.340 |
| | 9/32 | .281 | 1.688 | 5.909 |
| | 5/16 | .313 | 1.625 | 6.475 |
| | 11/32 | .344 | 1.562 | 7.002 |
| | 3/8 | .375 | 1.500 | 7.509 |
| | 7/16 | .438 | 1.375 | 8.476 |
| | 1/2 | .500 | 1.250 | 9.345 |
| | 9/16 | .563 | 1.124 | 10.14 |
| | 5/8 | .625 | 1.000 | 10.85 |
| | 3/4 | .750 | .750 | 12.02 |
| **2 5/16** | | | | |
| | 3/16 | .188 | 1.937 | 4.267 |
| | 7/32 | .219 | 1.875 | 4.898 |
| | 1/4 | .250 | 1.813 | 5.508 |
| **2 3/8** | | | | |
| | 16 | .065 | 2.245 | 1.604 |
| | 13 | .095 | 2.185 | 2.313 |
| | 11 | .120 | 2.135 | 2.890 |
| | 5/32 | .156 | 2.062 | 3.697 |
| | 3/16 | .188 | 2.000 | 4.391 |
| | 7/32 | .219 | 1.937 | 5.043 |
| | 1/4 | .250 | 1.875 | 5.674 |
| | 9/32 | .281 | 1.813 | 6.284 |
| **2 3/8** | | | | |
| | 5/16 | .313 | 1.750 | 6.893 |
| | 3/8 | .375 | 1.625 | 8.010 |
| | 7/16 | .438 | 1.500 | 9.061 |
| | 1/2 | .500 | 1.375 | 10.01 |
| | 9/16 | .563 | 1.249 | 10.90 |
| | 5/8 | .625 | 1.125 | 11.68 |
| **2 1/2** | | | | |
| | 16 | .065 | 2.370 | 1.690 |
| | 14 | .083 | 2.334 | 2.143 |
| | 13 | .095 | 2.310 | 2.440 |
| | 11 | .120 | 2.260 | 3.050 |
| | 10 | .134 | 2.232 | 3.386 |
| | 5/32 | .156 | 2.187 | 3.905 |
| | 3/16 | .188 | 2.125 | 4.642 |
| | 7/32 | .219 | 2.062 | 5.335 |
| | †1/4 | .250 | 2.000 | 6.008 |
| | 9/32 | .281 | 1.937 | 6.659 |
| | 5/16 | .313 | 1.875 | 7.311 |
| | 11/32 | .344 | 1.812 | 7.921 |
| | 3/8 | .375 | 1.750 | 8.511 |
| | 7/16 | .438 | 1.625 | 9.646 |
| | 1/2 | .500 | 1.500 | 10.68 |
| | 9/16 | .563 | 1.375 | 11.65 |
| | 5/8 | .625 | 1.250 | 12.52 |
| | 3/4 | .750 | 1.000 | 14.02 |
| **2 9/16** | | | | |
| | 1/4 | .250 | 2.062 | 6.176 |
| **2 5/8** | | | | |
| | 16 | .065 | 2.495 | 1.777 |
| | 13 | .095 | 2.435 | 2.567 |
| | 11 | .120 | 2.385 | 3.210 |
| | 5/32 | .156 | 2.312 | 4.114 |
| | 3/16 | .188 | 2.250 | 4.893 |
| | 7/32 | .219 | 2.187 | 5.627 |
| | 1/4 | .250 | 2.125 | 6.341 |
| | 9/32 | .281 | 2.063 | 7.035 |
| | 5/16 | .313 | 2.000 | 7.729 |
| | 3/8 | .375 | 1.875 | 9.011 |
| | 7/16 | .438 | 1.751 | 10.23 |
| | 1/2 | .500 | 1.625 | 11.35 |
| | 9/16 | .562 | 1.501 | 12.40 |
| | 5/8 | .625 | 1.375 | 13.35 |
| **2 3/4** | | | | |
| | 16 | .065 | 2.620 | 1.864 |
| | 13 | .095 | 2.560 | 2.694 |
| | 11 | .120 | 2.510 | 3.371 |
| | 5/32 | .156 | 2.437 | 4.322 |
| | 3/16 | .188 | 2.375 | 5.144 |
| | 7/32 | .219 | 2.312 | 5.920 |
| | †1/4 | .250 | 2.250 | 6.675 |
| | 9/32 | .281 | 2.187 | 7.410 |
| | 5/16 | .313 | 2.125 | 8.147 |
| | 3/8 | .375 | 2.000 | 9.512 |
| | 7/16 | .437 | 1.875 | 10.82 |

*(Continued)*

† Also drawn to O.D.-I.D. dimensions.

## SEAMLESS MECHANICAL TUBING

*(Continued)*

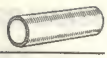
| Size O.D. | Average Wall B.W. Ga. | Dec. Inches | Nominal I.D. | Wt. Per Ft. in Lbs. |
|---|---|---|---|---|
| **2¾** | | | | |
| | ½ | .500 | 1.750 | 12.02 |
| | 9/16 | .562 | 1.625 | 13.15 |
| | 5/8 | .625 | 1.500 | 14.18 |
| | 11/16 | .688 | 1.374 | 15.15 |
| | ¾ | .750 | 1.250 | 16.02 |
| | ⅞ | .875 | 1.000 | 17.52 |
| | 1 | 1.000 | .750 | 18.69 |
| **2⅞** | | | | |
| | 16 | .065 | 2.745 | 1.951 |
| | 11 | .120 | 2.635 | 3.531 |
| | 5/32 | .156 | 2.563 | 4.530 |
| | 3/16 | .188 | 2.500 | 5.395 |
| | 7/32 | .219 | 2.437 | 6.212 |
| | ¼ | .250 | 2.375 | 7.009 |
| | 9/32 | .281 | 2.312 | 7.785 |
| | 5/16 | .313 | 2.250 | 8.564 |
| | ⅜ | .375 | 2.125 | 10.01 |
| | 7/16 | .438 | 2.000 | 11.40 |
| | ½ | .500 | 1.875 | 12.68 |
| | 9/16 | .562 | 1.751 | 13.90 |
| | 5/8 | .625 | 1.625 | 15.02 |
| | ¾ | .750 | 1.375 | 17.02 |
| **3** | | | | |
| | 16 | .065 | 2.870 | 2.037 |
| | 14 | .083 | 2.834 | 2.586 |
| | 13 | .095 | 2.810 | 2.947 |
| | 11 | .120 | 2.760 | 3.691 |
| | 5/32 | .156 | 2.687 | 4.738 |
| | 3/16 | .188 | 2.625 | 5.646 |
| | 7/32 | .219 | 2.562 | 6.505 |
| | †¼ | .250 | 2.500 | 7.343 |
| | 9/32 | .281 | 2.437 | 8.160 |
| | 5/16 | .313 | 2.375 | 8.982 |
| | ⅜ | .375 | 2.250 | 10.51 |
| | 7/16 | .437 | 2.125 | 11.98 |
| | ½ | .500 | 2.000 | 13.35 |
| | 9/16 | .563 | 1.875 | 14.65 |
| | 5/8 | .625 | 1.750 | 15.85 |
| | 11/16 | .687 | 1.625 | 16.99 |
| | ¾ | .750 | 1.500 | 18.02 |
| | ⅞ | .875 | 1.250 | 19.86 |
| | 1 | 1.000 | 1.000 | 21.36 |
| **3 1/16** | | | | |
| | 5/16 | .312 | 2.438 | 9.193 |
| | ⅜ | .375 | 2.312 | 10.77 |
| **3⅛** | | | | |
| | 16 | .065 | 2.995 | 2.124 |
| | 11 | .120 | 2.885 | 3.851 |
| | 3/16 | .188 | 2.750 | 5.897 |
| | 7/32 | .218 | 2.687 | 6.797 |
| | ¼ | .250 | 2.625 | 7.676 |
| | 5/16 | .313 | 2.499 | 9.400 |
| | ⅜ | .375 | 2.375 | 11.01 |
| | 7/16 | .438 | 2.250 | 12.57 |
| | ½ | .500 | 2.125 | 14.02 |
| | 9/16 | .563 | 2.000 | 15.40 |
| **3⅛** | | | | |
| | 5/8 | .625 | 1.875 | 16.69 |
| | ¾ | .750 | 1.625 | 19.02 |
| | ⅞ | .875 | 1.375 | 21.03 |
| **3¼** | | | | |
| | 16 | .065 | 3.120 | 2.211 |
| | 13 | .095 | 3.060 | 3.201 |
| | 11 | .120 | 3.010 | 4.011 |
| | 5/32 | .156 | 2.938 | 5.155 |
| | 3/16 | .188 | 2.875 | 6.148 |
| | 7/32 | .219 | 2.812 | 7.089 |
| | †¼ | .250 | 2.750 | 8.010 |
| | 9/32 | .281 | 2.688 | 8.910 |
| | 5/16 | .313 | 2.625 | 9.818 |
| | ⅜ | .375 | 2.500 | 11.51 |
| | 7/16 | .438 | 2.375 | 13.15 |
| | ½ | .500 | 2.250 | 14.69 |
| | 9/16 | .563 | 2.125 | 16.16 |
| | 5/8 | .625 | 2.000 | 17.52 |
| | ¾ | .750 | 1.750 | 20.03 |
| | ⅞ | .875 | 1.500 | 22.19 |
| | 1 | 1.000 | 1.250 | 24.03 |
| **3⅜** | | | | |
| | 16 | .065 | 3.245 | 2.298 |
| | 13 | .095 | 3.185 | 3.328 |
| | 11 | .120 | 3.135 | 4.172 |
| | 5/32 | .156 | 3.063 | 5.363 |
| | 3/16 | .188 | 3.000 | 6.399 |
| | ¼ | .250 | 2.875 | 8.344 |
| | 5/16 | .313 | 2.749 | 10.24 |
| | ⅜ | .375 | 2.625 | 12.02 |
| | 7/16 | .438 | 2.501 | 13.74 |
| | ½ | .500 | 2.375 | 15.35 |
| | 9/16 | .563 | 2.249 | 16.91 |
| | 5/8 | .625 | 2.125 | 18.36 |
| | ¾ | .750 | 1.875 | 21.03 |
| **3½** | | | | |
| | 16 | .065 | 3.370 | 2.385 |
| | 13 | .095 | 3.310 | 3.455 |
| | 11 | .120 | 3.260 | 4.332 |
| | 10 | .134 | 3.232 | 4.817 |
| | 5/32 | .156 | 3.188 | 5.571 |
| | 3/16 | .188 | 3.125 | 6.650 |
| | 7/32 | .219 | 3.063 | 7.674 |
| | †¼ | .250 | 3.000 | 8.678 |
| | 9/32 | .281 | 2.938 | 9.660 |
| | 5/16 | .313 | 2.875 | 10.65 |
| | 11/32 | .344 | 2.812 | 11.59 |
| | ⅜ | .375 | 2.750 | 12.52 |
| | 7/16 | .438 | 2.625 | 14.32 |
| | ½ | .500 | 2.500 | 16.02 |
| | 9/16 | .563 | 2.374 | 17.66 |
| | 5/8 | .625 | 2.250 | 19.19 |
| | ¾ | .750 | 2.000 | 22.03 |
| | ⅞ | .875 | 1.750 | 24.53 |
| | 1 | 1.000 | 1.500 | 26.70 |

*(Continued)*

† Also drawn to O.D.-I.D. dimensions.

## SEAMLESS MECHANICAL TUBING

*(Continued)*



| Size O.D. | Average Wall B.W. Ga. | Average Wall Dec. Inches | Nominal I.D. | Wt. Per Ft. in Lbs. |
|---|---|---|---|---|
| **3⅝** | | | | |
| | 16 | .065 | 3.495 | 2.471 |
| | 11 | .120 | 3.385 | 4.492 |
| | 3/16 | .188 | 3.250 | 6.901 |
| | ¼ | .250 | 3.125 | 9.011 |
| | 5/16 | .313 | 3.000 | 11.07 |
| | ⅜ | .375 | 2.875 | 13.02 |
| | 7/16 | .438 | 2.750 | 14.91 |
| | ½ | .500 | 2.625 | 16.69 |
| | 9/16 | .563 | 2.501 | 18.41 |
| | ⅝ | .625 | 2.375 | 20.03 |
| | ¾ | .750 | 2.125 | 23.03 |
| **3 1/16** | | | | |
| | 7/16 | .438 | 2.874 | 15.20 |
| **3¾** | | | | |
| | 13 | .095 | 3.560 | 3.708 |
| | 11 | .120 | 3.510 | 4.652 |
| | 5/32 | .156 | 3.437 | 5.988 |
| | 3/16 | .188 | 3.375 | 7.152 |
| | ¼ | .250 | 3.250 | 9.345 |
| | 5/16 | .313 | 3.125 | 11.49 |
| | †⅜ | .375 | 3.000 | 13.52 |
| | 7/16 | .437 | 2.875 | 15.49 |
| | ½ | .500 | 2.750 | 17.36 |
| | ⅝ | .625 | 2.500 | 20.86 |
| | 11/16 | .688 | 2.374 | 22.50 |
| | ¾ | .750 | 2.250 | 24.03 |
| | ⅞ | .875 | 2.000 | 26.87 |
| | 1 | 1.000 | 1.750 | 29.37 |
| **3⅞** | | | | |
| | 11 | .120 | 3.635 | 4.812 |
| | 3/16 | .188 | 3 500 | 7.403 |
| | ¼ | .250 | 3.375 | 9.679 |
| | 5/16 | .313 | 3.249 | 11.91 |
| | ⅜ | .375 | 3.125 | 14.02 |
| | 7/16 | .438 | 3.000 | 16.08 |
| | ½ | .500 | 2.875 | 18.02 |
| | 9/16 | .563 | 2.749 | 19.91 |
| | ⅝ | .625 | 2.625 | 21.69 |
| **4** | | | | |
| | 16 | .065 | 3.870 | 2.732 |
| | 14 | .083 | 3.834 | 3.472 |
| | 13 | .095 | 3.810 | 3.962 |
| | 11 | .120 | 3.760 | 4.973 |
| | 5/32 | .156 | 3.687 | 6.404 |
| | 3/16 | .188 | 3.625 | 7.654 |
| | 7/32 | .219 | 3.562 | 8.843 |
| | †¼ | .250 | 3.500 | 10.01 |
| | 9/32 | .281 | 3.438 | 11.16 |
| | 5/16 | .313 | 3.375 | 12.33 |
| | ⅜ | .375 | 3.250 | 14.52 |
| | 7/16 | .437 | 3.126 | 16.66 |
| | **½ | .500 | 3.000 | 18.69 |
| | 9/16 | .563 | 2.875 | 20.67 |
| | **⅝ | .625 | 2.750 | 22.53 |
| | 11/16 | .688 | 2.624 | 24.34 |
| | ¾ | .750 | 2.500 | 26.03 |
| **4** | | | | |
| | ⅞ | .875 | 2.250 | 29.20 |
| | 1 | 1.000 | 2.000 | 32.04 |
| | *1¼ | 1.250 | 1.500 | 36.71 |
| **4⅛** | | | | |
| | 11 | .120 | 3.885 | 5.133 |
| | 3/16 | .188 | 3.749 | 7.905 |
| | ¼ | .250 | 3.625 | 10.35 |
| | 5/16 | .313 | 3.500 | 12.74 |
| | ⅜ | .375 | 3.375 | 15.02 |
| | 7/16 | .438 | 3.249 | 17.25 |
| | ½ | .500 | 3.125 | 19.36 |
| | 9/16 | .563 | 3.001 | 21.42 |
| | ⅝ | .625 | 2.875 | 23.36 |
| **4¼** | | | | |
| | 13 | .095 | 4.060 | 4.216 |
| | 11 | .120 | 4.010 | 5.293 |
| | 5/32 | .156 | 3.937 | 6.821 |
| | 3/16 | .188 | 3.875 | 8.156 |
| | ¼ | .250 | 3.750 | 10.68 |
| | 5/16 | .313 | 3.625 | 13.16 |
| | †⅜ | .375 | 3.500 | 15.52 |
| | 7/16 | .437 | 3.375 | 17.83 |
| | ½ | .500 | 3.250 | 20.03 |
| | **⅝ | .625 | 3.000 | 24.20 |
| | 11/16 | .688 | 2.875 | 26.17 |
| | ¾ | .750 | 2.750 | 28.04 |
| | ⅞ | .875 | 2.500 | 31.54 |
| | 1 | 1.000 | 2.250 | 34.71 |
| | *1⅛ | 1.125 | 2.000 | 37.55 |
| **4⅜** | | | | |
| | 3/16 | .188 | 4.001 | 8.407 |
| | ¼ | .250 | 3.875 | 11.01 |
| | 5/16 | .313 | 3.759 | 13.58 |
| | ⅜ | .375 | 3.625 | 16.02 |
| | 7/16 | .438 | 3.500 | 18.42 |
| | ½ | .500 | 3.375 | 20.69 |
| | ⅝ | .625 | 3.125 | 25.03 |
| | ¾ | .750 | 2.875 | 29.04 |
| **4½** | | | | |
| | 16 | .065 | 4.370 | 3.079 |
| | 13 | .095 | 4.310 | 4.469 |
| | 11 | .120 | 4.260 | 5.613 |
| | 5/32 | .156 | 4.188 | 7.237 |
| | 3/16 | .188 | 4.125 | 8.658 |
| | 7/32 | .219 | 4.062 | 10.01 |
| | †¼ | .250 | 4.000 | 11.35 |
| | 5/16 | .313 | 3.875 | 14.00 |
| | †⅜ | .375 | 3.750 | 16.52 |
| | 7/16 | .438 | 3.625 | 19.00 |
| | **½ | .500 | 3.500 | 21.36 |
| | 9/16 | .562 | 3.375 | 23.67 |
| | **⅝ | .625 | 3.250 | 25.87 |
| | 11/16 | .687 | 3.125 | 28.01 |
| | **¾ | .750 | 3.000 | 30.04 |
| | ⅞ | .875 | 2.750 | 33.88 |
| | 1 | 1.000 | 2.500 | 37.38 |
| | *1¼ | 1.250 | 2.000 | 43.39 |

*(Continued)*

* These sizes are Hot Finished Seamless Mechanical Tubing.
** Also available in Hot Finished Seamless Mechanical Tubing.
† Also drawn to O.D.-I.D. dimensions.

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## SEAMLESS MECHANICAL TUBING

*(Continued)*

| Size O.D. | Average Wall B.W. Ga. | Average Wall Dec. Inches | Nominal I.D. | Wt. Per Ft. in Lbs. |
|---|---|---|---|---|
| **4⅝** | | | | |
| | 3/16 | .187 | 4.251 | 8.909 |
| | 1/4 | .250 | 4.125 | 11.68 |
| | 5/16 | .313 | 4.000 | 14.41 |
| | 3/8 | .375 | 3.875 | 17.02 |
| | 1/2 | .500 | 3.625 | 22.03 |
| | 5/8 | .625 | 3.375 | 26.70 |
| **4¾** | | | | |
| | 13 | .095 | 4.560 | 4.723 |
| | 11 | .120 | 4.510 | 5.934 |
| | 3/16 | .188 | 4.375 | 9.160 |
| | 1/4 | .250 | 4.250 | 12.02 |
| | 5/16 | .313 | 4.125 | 14.83 |
| | †3/8 | .375 | 4.000 | 17.52 |
| | 7/16 | .438 | 3.874 | 20.17 |
| | 1/2 | .500 | 3.750 | 22.70 |
| | 9/16 | .563 | 3.624 | 25.18 |
| | 5/8 | .625 | 3.500 | 27.53 |
| | 3/4 | .750 | 3.250 | 32.04 |
| | 7/8 | .875 | 3.000 | 36.21 |
| | 1 | 1.000 | 2.750 | 40.05 |
| **4⅞** | | | | |
| | 7/16 | .438 | 3.999 | 20.76 |
| | 1/2 | .500 | 3.875 | 23.36 |
| **5** | | | | |
| | 11 | .120 | 4.760 | 6.254 |
| | 10 | .134 | 4.732 | 6.964 |
| | 5/32 | .156 | 4.687 | 8.070 |
| | 3/16 | .188 | 4.625 | 9.662 |
| | †1/4 | .250 | 4.500 | 12.68 |
| | 5/16 | .313 | 4.375 | 15.67 |
| | 3/8 | .375 | 4.250 | 18.52 |
| | 7/16 | .438 | 4.125 | 21.34 |
| | †**1/2 | .500 | 4.000 | 24.03 |
| | 9/16 | .562 | 3.876 | 26.68 |
| | 5/8 | .625 | 3.750 | 29.20 |
| | **3/4 | .750 | 3.500 | 34.04 |
| | **7/8 | .875 | 3.250 | 38.55 |
| | **1 | 1.000 | 3.000 | 42.72 |
| | *1 1/4 | 1.250 | 2.500 | 50.06 |
| **5⅛** | | | | |
| | 5/16 | .313 | 4.501 | 16.09 |
| | 1/2 | .500 | 4.125 | 24.70 |
| | 5/8 | .625 | 3.875 | 30.04 |
| | 1 | 1.000 | 3.125 | 44.06 |
| **5¼** | | | | |
| | 11 | .120 | 5.010 | 6.575 |
| | 5/32 | .156 | 4.938 | 8.487 |
| | 3/16 | .187 | 4.875 | 10.16 |
| | 1/4 | .250 | 4.750 | 13.35 |
| | †3/8 | .375 | 4.500 | 19.52 |
| | 1/2 | .500 | 4.250 | 25.37 |
| | 5/8 | .625 | 4.000 | 30.87 |
| | 3/4 | .750 | 3.750 | 36.05 |
| | 7/8 | .875 | 3.500 | 40.88 |
| | 1 | 1.000 | 3.250 | 45.39 |
| **5⅜** | | | | |
| | 3/16 | .188 | 5.000 | 10.41 |
| **5½** | | | | |
| | 5/32 | .156 | 5.188 | 8.904 |
| | 3/16 | .187 | 5.125 | 10.67 |
| | †1/4 | .250 | 5.000 | 14.02 |
| | 5/16 | .313 | 4.875 | 17.34 |
| | 3/8 | .375 | 4.750 | 20.53 |
| | †**1/2 | .500 | 4.500 | 26.70 |
| | 5/8 | .625 | 4.250 | 32.54 |
| | **3/4 | .750 | 4.000 | 38.05 |
| | 7/8 | .875 | 3.750 | 43.22 |
| | **1 | 1.000 | 3.500 | 48.06 |
| | *1 1/4 | 1.250 | 3.000 | 56.74 |
| | *1 1/2 | 1.500 | 2.500 | 64.08 |
| **5⅝** | | | | |
| | 5/16 | .313 | 5.001 | 17.76 |
| | 5/8 | .625 | 4.375 | 33.38 |
| **5¾** | | | | |
| | 3/16 | .188 | 5.375 | 11.17 |
| | 1/4 | .250 | 5.250 | 14.69 |
| | †3/8 | .375 | 5.000 | 21.53 |
| | 1/2 | .500 | 4.750 | 28.04 |
| | 5/8 | .625 | 4.500 | 34.21 |
| | 3/4 | .750 | 4.250 | 40.05 |
| | 7/8 | .875 | 4.000 | 45.56 |
| | 1 | 1.000 | 3.750 | 50.73 |
| **6** | | | | |
| | 11 | .120 | 5.760 | 7.536 |
| | 3/16 | .188 | 5.625 | 11.67 |
| | †1/4 | .250 | 5.500 | 15.35 |
| | 5/16 | .313 | 5.374 | 19.01 |
| | 3/8 | .375 | 5.250 | 22.53 |
| | 7/16 | .438 | 5.124 | 26.02 |
| | †**1/2 | .500 | 5.000 | 29.37 |
| | 9/16 | .562 | 4.876 | 32.69 |
| | **5/8 | .625 | 4.750 | 35.88 |
| | **3/4 | .750 | 4.500 | 42.05 |
| | 7/8 | .875 | 4.250 | 47.89 |
| | **1 | 1.000 | 4.000 | 53.40 |
| | *1 1/2 | 1.500 | 3.000 | 72.09 |
| **6¼** | | | | |
| | 3/16 | .187 | 5.876 | 12.17 |
| | 1/4 | .250 | 5.750 | 16.02 |
| | †3/8 | 375 | 5.500 | 23.53 |
| | 1/2 | .500 | 5.250 | 30.71 |
| | 5/8 | .625 | 5.000 | 37.55 |
| | 3/4 | .750 | 4.750 | 44.06 |
| | 1 | 1.000 | 4.250 | 56.07 |
| **6½** | | | | |
| | 11 | .120 | 6.260 | 8.177 |
| | 3/16 | .187 | 6.125 | 12.67 |
| | †1/4 | .250 | 6.000 | 16.69 |
| | 3/8 | .375 | 5.750 | 24.53 |

*(Continued)*

* These sizes are Hot Finished Seamless Mechanical Tubing.
** Also available in Hot Finished Seamless Mechanical Tubing.
† Also drawn to O.D.-I.D. dimensions.

## SEAMLESS MECHANICAL TUBING

*(Continued)*

Sizes over 10" O.D. x ½" wall in our Chicago plant

| Size O.D. | B.W. Ga. | Average Wall Dec. Inches | Nominal I.D. | Wt. Per Ft. in Lbs. |
|---|---|---|---|---|
| **6½** | | | | |
| | †½ | .500 | 5.500 | 32.04 |
| | ⅝ | .625 | 5.250 | 39.22 |
| | ¾ | .750 | 5.000 | 46.06 |
| | 1 | 1.000 | 4.500 | 58.74 |
| | *1½ | 1.500 | 3.500 | 80.10 |
| **6¾** | | | | |
| | ¼ | .250 | 6.250 | 17.36 |
| | †⅜ | .375 | 6.000 | 25.53 |
| | ½ | .500 | 5.750 | 33.38 |
| | ⅝ | .625 | 5.500 | 40.88 |
| | ¾ | .750 | 5.250 | 48.06 |
| | **1 | 1.000 | 4.750 | 61.41 |
| **7** | | | | |
| | 3/16 | .187 | 6.625 | 13.68 |
| | †¼ | .250 | 6.500 | 18.02 |
| | ⅜ | .375 | 6.250 | 26.53 |
| | †**½ | .500 | 6.000 | 34.71 |
| | **¾ | .750 | 5.500 | 50.06 |
| | **1 | 1.000 | 5.000 | 64.08 |
| **7¼** | | | | |
| | ¼ | .250 | 6.750 | 18.69 |
| | †⅜ | .375 | 6.500 | 27.53 |
| | ½ | .500 | 6.250 | 36.05 |
| | ¾ | .750 | 5.750 | 52.07 |
| **7½** | | | | |
| | †¼ | .250 | 7.000 | 19.36 |
| | ⅜ | .375 | 6.750 | 28.54 |
| | †½ | .500 | 6.500 | 37.38 |
| | ⅝ | .625 | 6.250 | 45.89 |
| | ¾ | .750 | 6.000 | 54.07 |
| | 1 | 1.000 | 5.500 | 69.42 |
| **7⅝** | | | | |
| | *⅝ | .625 | 6.375 | 46.73 |
| **7¾** | | | | |
| | ¼ | .250 | 7.250 | 20.03 |
| | ⅜ | .375 | 7.000 | 29.54 |
| | ½ | .500 | 6.750 | 38.72 |
| | ¾ | .750 | 6.250 | 56.07 |
| | 1 | 1.000 | 5.750 | 72.09 |
| **8** | | | | |
| | †¼ | .250 | 7.500 | 20.69 |
| | ⅜ | .375 | 7.250 | 30.54 |
| | †½ | .500 | 7.000 | 40.05 |
| | ¾ | .750 | 6.500 | 58.07 |
| | 1 | 1.000 | 6.000 | 74.76 |
| | *1½ | 1.500 | 5.000 | 104.1 |
| **8¼** | | | | |
| | ½ | .500 | 7.250 | 41.39 |
| | ⅞ | .875 | 6.500 | 68.92 |
| **8½** | | | | |
| | †¼ | .250 | 8.000 | 22.03 |
| | ⅜ | .375 | 7.750 | 32.54 |
| | †½ | .500 | 7.500 | 42.72 |
| **8½** | | | | |
| | ¾ | .750 | 7.000 | 62.08 |
| | 1 | 1.000 | 6.500 | 80.10 |
| | *1¼ | 1.250 | 6.000 | 96.79 |
| **8¾** | | | | |
| | ½ | .500 | 7.750 | 44.06 |
| **9** | | | | |
| | ¼ | .250 | 8.500 | 23.36 |
| | ⅜ | .375 | 8.250 | 34.54 |
| | †½ | .500 | 8.000 | 45.39 |
| | ¾ | .750 | 7.500 | 66.08 |
| | 1 | 1.000 | 7.000 | 85.44 |
| | *1½ | 1.500 | 6.000 | 120.2 |
| **9½** | | | | |
| | ¼ | .250 | 9.000 | 24.70 |
| | ½ | .500 | 8.500 | 48.06 |
| | *1⅛ | 1.125 | 7.250 | 100.6 |
| **10** | | | | |
| | ¼ | .250 | 9.500 | 26.03 |
| | ½ | .500 | 9.000 | 50.73 |
| | ¾ | .750 | 8.500 | 74.09 |
| | 1 | 1.000 | 8.000 | 96.12 |
| | *1⅛ | 1.125 | 7.750 | 106.6 |
| **10½** | | | | |
| | ¼ | .250 | 10.000 | 27.37 |
| | ½ | .500 | 9.500 | 53.40 |
| | 1 | 1.000 | 8.500 | 101.5 |
| **10¾††** | | | | |
| | .843 | .843 | 9.064 | 89.2 |
| | 1 | 1.000 | 8.750 | 104.1 |
| | 1⅛ | 1.125 | 8.500 | 115.6 |
| | 1¼ | 1.250 | 8.250 | 126.8 |
| **11¾††** | | | | |
| | .843 | .843 | 10.064 | 98.2 |
| | 1 | 1.000 | 9.750 | 114.8 |
| | 1¼ | 1.250 | 9.250 | 140.2 |
| **12** | | | | |
| | ⅜ | .375 | 11.250 | 46.56 |
| | ½ | .500 | 11.000 | 61.41 |
| | ¾ | .750 | 10.500 | 90.11 |
| | 1 | 1.000 | 10.000 | 117.5 |
| **12¾††** | | | | |
| | .843 | .843 | 11.064 | 107.2 |
| | 1 | 1.000 | 10.760 | 125.5 |
| | 1 5/16 | 1.313 | 10.124 | 160.4 |
| | 1½ | 1.500 | 9.750 | 180.2 |
| **14††** | | | | |
| | ¾ | .750 | 12.500 | 106.1 |
| | .937 | .937 | 12.126 | 130.7 |
| | 1¼ | 1.250 | 11.500 | 170.2 |
| | 1.406 | 1.406 | 11.188 | 189.1 |
| **16††** | | | | |
| | 1 1/32 | 1.031 | 13.938 | 164.8 |
| | 1 7/32 | 1.218 | 13.562 | 192.4 |

* These sizes are Hot Finished Seamless Mechanical Tubing.
** Also available in Hot Finished Seamless Mechanical Tubing.
† Also drawn to O.D.-I.D. dimensions.
†† These sizes are Hot Rolled Seamless Pipe. They can be furnished to meet A.S.T.M. A-53 and/or A-106, Grade B.

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## ROCKRITE* QUALITY TUBING

**SUPERIOR CYLINDER FINISH**
**SEAMLESS MECHANICAL—LOW CARBON**
*Superior Cylinder finish rarely needs further machining*
Identification Color: White

Rockrite tubing is made by a unique process which produces remarkable uniformity of wall thickness, a high degree of concentricity, and a smoothness of inside surface exceeded only by expensive honed tubes.

Its superior cylinder finish derives from the compression-forging action of the Rockrite process. Deviations from exact dimensions go to the O.D., making the bore a nearly perfect cylinder.

It is possible to use Rockrite tubing for many applications by simply cutting to length without further processing. And since inside working parts may be standardized, the use of Rockrite compression-sized tubing often results in saving costs of special machining of interior parts.

The Rockrite process also improves machinability and mechanical properties.

### TOLERANCES

| Size | O.D. Plus | O.D. Minus | I.D. Plus | I.D. Minus |
|---|---|---|---|---|
| Under 1½" O.D. | .010 | .000 | .000 | .005 |
| 1½" O.D. to 2½" O.D. Incl. | .012 | .000 | .000 | .005 |
| Over 2½" O.D. to 3½" O.D. Incl. | .014 | 000 | .000 | .006 |
| Over 3½" O.D. to 5½" O.D. Incl. | .020 | .000 | .000 | .008 |
| Over 5½" O.D. to 6½" O.D. Incl. | .024 | .000 | .000 | .010 |

The tolerances shown include allowance for ovality. Tubes larger than 3¼" O.D. with wall thickness less than .250" may not conform to above tolerances. Refer questions of tolerance in this size range to our office.

### Random Lengths: 5 to 24 Ft.

| Size O.D. | I.D. (Tolerance Limit) | Wt. per Ft. in Lbs. | Size O.D. | I.D. (Tolerance Limit) | Wt. per Ft. in Lbs |
|---|---|---|---|---|---|
| 1½ | 1.245-1.250 | 1.836 | 3¼ | 2.494-2.500 | 11.51 |
| 1¾ | 1.495-1.500 | 2.169 | 3⅜ | 2.994-3.000 | 6.399 |
| 2 | 1.745-1.750 | 2.503 | 3½ | 2.994-3.000 | 8.678 |
| 2 | 1.495-1.500 | 4.673 | 3¾ | 3.242-3.250 | 9.345 |
| 2¼ | 1.995-2.000 | 2.837 | 3⅞ | 3.492-3.500 | 7.403 |
| 2¼ | 1.745-1.750 | 5.340 | 4 | 3.492-3.500 | 10.01 |
| 2½ | 1.995-2.000 | 6.008 | 4½ | 3.992-4.000 | 11.35 |
| 2¾ | 2.494-2.500 | 3.504 | 4¾ | 3.992-4.000 | 17.52 |
| 2¾ | 2.244-2.250 | 6.675 | 5 | 4.492-4.500 | 12.68 |
| 2⅞ | 2.494-2.500 | 5.395 | 5½ | 4.992-5.000 | 14.02 |
| 3 | 2.494-2.500 | 7.343 | 6 | 5.490-5.500 | 15.35 |
| 3¼ | 2.994-3.000 | 4.172 | 6½ | 5.990-6.000 | 16.69 |

* ROCKRITE is a registered Trade-Mark of Tube Reducing Corporation. Ryerson is exclusive warehouse distributer of Rockrite.

## COLD DRAWN WELDED TUBING
### SPECIAL SMOOTH CYLINDER I.D.

*Pressure Tested to 1000 psi*

**Electric Resistance Welded—For Air and Hydraulic Cylinders**

A high quality cold drawn, welded tubing with an especially smooth inside finish made to close tolerances. Designed for medium high pressure hydraulic applications, its smooth inside finish is in most cases ready for use as a cylinder without further processing. Special methods and care used in manufacture make this top quality for cylinder applications. Cost is relatively low.

**Random Lengths: 17 to 24 Ft.**

| Size O.D. | I.D. (Tolerance Limit) | Wt. per Ft. in Lbs. | Size O.D. | I.D. (Tolerance Limit) | Wt. per Ft. in Lbs. |
|---|---|---|---|---|---|
| 1½ | 1.247-1.250 | 1.836 | 2⅞ | 2.495-2.500 | 5.395 |
| 1¾ | 1.497-1.500 | 2.169 | 2¾ | 2.495-2.500 | 3.504 |
| 2 | 1.747-1.750 | 2.503 | 3 | 2.745-2.750 | 3.838 |
| 2¼ | 1.996-2.000 | 2.837 | 3¼ | 2.994-3.000 | 4.172 |
| 2½ | 2.246-2.250 | 3.171 | 3⅞ | 3.494-3.500 | 7.403 |

## SEAMLESS MECHANICAL TUBING
### Specially Drawn to O.D.-I.D. Dimensions

*For Cylinder Applications that require Honing*

It is accepted practice to stock Seamless Mechanical Tubing to O.D. and Wall dimensions only. However, for cylinder applications where the inside diameter is to be honed, we maintain stocks of Cold Drawn Seamless made to standard I.D. as well as O.D. dimensions.

Since this tubing is cold drawn, it has a standard commercial finish. In addition, special care and attention produce a tube that gives the best possible results at a comparatively low material cost.

**Tolerances:** Standard tolerances to apply

**Random Lengths: 5 to 24 Ft.**

| Size in Inches O.D. | I.D. | Nominal Wall in Inches | Wt. per Ft. in Lbs. | Size in Inches O.D. | I.D. | Nominal Wall in Inches | Wt. per Ft. in Lbs. |
|---|---|---|---|---|---|---|---|
| 2 | 1½ | ¼ | 4.673 | 5¾ | 5 | ⅜ | 21.53 |
| 2¼ | 1¾ | ¼ | 5.340 | 6 | 5½ | ¼ | 15.35 |
| 2½ | 2 | ¼ | 6.008 | 6 | 5 | ½ | 29.37 |
| 2¾ | 2¼ | ¼ | 6.675 | 6¼ | 5½ | ⅜ | 23.53 |
| 3 | 2½ | ¼ | 7.343 | 6½ | 6 | ¼ | 16.69 |
| 3¼ | 2¾ | ¼ | 8.010 | 6½ | 5½ | ½ | 32.04 |
| 3½ | 3 | ¼ | 8.678 | 6¾ | 6 | ⅜ | 25.53 |
| 3¾ | 3 | ⅜ | 13.52 | 7 | 6½ | ¼ | 18.02 |
| 4 | 3½ | ¼ | 10.01 | 7 | 6 | ½ | 34.71 |
| 4¼ | 3½ | ⅜ | 15.52 | 7¼ | 6½ | ⅜ | 27.53 |
| 4½ | 4 | ¼ | 11.35 | 7½ | 7 | ¼ | 19.36 |
| 4½ | 3¾ | ⅜ | 16.52 | 7½ | 6½ | ½ | 37.38 |
| 4¾ | 4 | ⅜ | 17.52 | 8 | 7½ | ¼ | 20.69 |
| 5 | 4½ | ¼ | 12.68 | 8 | 7 | ½ | 40.05 |
| 5 | 4 | ½ | 24.03 | 8½ | 8 | ¼ | 22.03 |
| 5¼ | 4½ | ⅜ | 19.52 | 8½ | 7½ | ½ | 42.72 |
| 5½ | 5 | ¼ | 14.02 | 9 | 8 | ½ | 45.39 |
| 5½ | 4½ | ½ | 26.70 | | | | |

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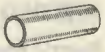
## HYDRAULIC FLUID LINE TUBING

**COLD DRAWN SEAMLESS**



**SAE 1010**

**Conforms to J.I.C. Specifications**

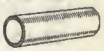
Soft annealed for ease of bending and flaring and specially processed to insure the clean I.D. necessary in hydraulic systems. Both ends are corked to protect the inside of the tubing from foreign matter. It is pressure tested to 1000 lbs. per square inch and meets the requirements of the Joint Industry Conference on Hydraulic Standards for Industrial Equipment. We are always glad to handle your mill orders for sizes and quantities not available from stock. Write for descriptive literature.

**Stock Lengths: 12 Ft. and 20 Ft.**

| Size O.D. | Average Wall B.W. Ga. | Average Wall Dec. Inches | Bursting Pressure, psi | Wt. per Ft., Lbs. |
|---|---|---|---|---|
| 1/8 | 22 | .028 | 22400 | .0290 |
| 3/16 | 22 | .028 | 14935 | .0478 |
| | 20 | .035 | 18600 | .0572 |
| 7/32 | 18 | .049 | 22015 | .0890 |
| 1/4 | 20 | .035 | 14000 | .0804 |
| | 18 | .049 | 19600 | .1052 |
| 5/16 | 20 | .035 | 11200 | .1039 |
| | 18 | .049 | 15680 | .1382 |
| 3/8 | 20 | .035 | 9330 | .1271 |
| | 18 | .049 | 13100 | .1706 |
| | 16 | .065 | 17335 | 2152 |
| 7/16 | 20 | .035 | 8000 | .1506 |
| | 18 | .049 | 11200 | .2036 |
| | 16 | .065 | 14855 | .2589 |
| 1/2 | 20 | .035 | 7000 | .1738 |
| | 18 | .049 | 9800 | .2360 |
| | 16 | .065 | 13000 | .3020 |
| 5/8 | 20 | .035 | 5600 | .2205 |
| | 18 | .049 | 7840 | .3014 |
| 5/8 | 16 | .065 | 10400 | .3888 |
| | 14 | .083 | 13280 | .4805 |
| 3/4 | 20 | .035 | 4665 | .2673 |
| | 18 | .049 | 6530 | .3668 |
| | 16 | .065 | 8660 | .4755 |
| | 13 | .095 | 12665 | .6646 |
| 7/8 | 18 | .049 | 6720 | .4323 |
| | 16 | .065 | 7430 | .5623 |
| | 13 | .095 | 10855 | .7914 |
| 1 | 18 | .049 | 5880 | .4977 |
| | 16 | .065 | 6500 | .6491 |
| | 13 | .095 | 9500 | .9182 |
| 1 1/8 | 13 | .095 | 8455 | 1.045 |
| 1 1/4 | 16 | .065 | 5200 | .8226 |
| | 13 | .095 | 7600 | 1.172 |
| 1 1/2 | 16 | .065 | 4335 | .9962 |
| | 13 | .095 | 6335 | 1.426 |
| 2 | 10 | .134 | 6700 | 2.670 |
| | 3/16 | .188 | 9400 | 3.638 |

## SEAMLESS MECHANICAL TUBING

**ROUND—COLD DRAWN—.40 TO .50 CARBON**



**Random Lengths: 5 to 24 Ft.**

In our Cleveland plant

| Size O.D. | Size I.D. | Nominal Size O.D. | Nominal Size I.D. | Average Wall Fract. | Average Wall Dec. | Wt. per Ft. in Lbs. |
|---|---|---|---|---|---|---|
| 2.568 | 2.063 | 2 5/16 | 2 1/16 | 1/4 | .250 | 6.258 |
| 2.693 | 2.063 | 2 11/16 | 2 1/16 | 5/16 | .313 | 7.999 |
| 2.813 | 2.313 | 2 13/16 | 2 5/16 | 1/4 | .250 | 6.931 |
| 2.943 | 2.313 | 2 15/16 | 2 5/16 | 5/16 | .313 | 8.841 |
| 3.068 | 2.313 | 3 1/16 | 2 5/16 | 3/8 | .375 | 10.862 |
| 3.068 | 2.563 | 3 1/16 | 2 1/16 | 1/4 | .250 | 7.604 |
| 3.193 | 2.563 | 3 3/16 | 2 1/16 | 5/16 | .313 | 9.687 |
| 3.443 | 2.813 | 3 7/16 | 2 13/16 | 5/16 | .313 | 10.520 |
| 3.535 | 2.919 | | | | .308 | 10.616 |
| 3.568 | 3.068 | 3 5/16 | 3 1/16 | 1/4 | .250 | 8.864 |
| 3.693 | 3.068 | 3 11/16 | 3 1/16 | 5/16 | .313 | 11.289 |
| 4.193 | 3.568 | 4 3/16 | 3 5/16 | 5/16 | .313 | 12.966 |
| 4.443 | 3.568 | 4 7/16 | 3 5/16 | 7/16 | .437 | 18.807 |
| 4.685 | 3.889 | | | | .398 | 18.220 |

## WELDED MECHANICAL TUBING

**Electric Resistance Welded • AISI MT 1010**

**COLD ROLLED and HOT ROLLED BRIGHT FINISH**

Manufactured from MT 1010 strip steel with uniform wall thickness assured by the close strip tolerance. Welding flash is removed by either rolling or cutting. Hot Rolled is formed from Hot Rolled MT 1010 pickled strip and has a good finish suitable for painting. Cold Rolled is manufactured from Cold Rolled MT 1010 No. 2 Finish strip and is particularly adapted to applications requiring high finish. Both types can be formed, bent, swedged, flattened, etc.

We are always glad to handle your mill orders for sizes and quantities not available from stock and will gladly send descriptive material to you on request.

**Random Lengths: 5 to 20 Ft.**

| Size O.D. | Average Wall B.W. Ga. | Average Wall Dec. Inches | Nominal I.D. | Wt. Per Ft. in Lbs. |
|---|---|---|---|---|
| **⅜x** | | | | |
| | CR 22 | .028 | .319 | .1038 |
| | CR 20 | .035 | .305 | .1271 |
| | CR 18 | .049 | .277 | .1706 |
| | CR 16 | .065 | .245 | .2152 |
| **½x** | | | | |
| | CR 22 | .028 | .444 | .1411 |
| | CR 20 | .035 | .430 | .1738 |
| | CR 18 | .049 | .402 | .2360 |
| | CR 16 | .065 | .370 | .3020 |
| **⅝x** | | | | |
| | CR 22 | .028 | .569 | .1785 |
| | CR 20 | .035 | .555 | .2205 |
| | CR 18 | .049 | .527 | .3014 |
| | CR 16 | .065 | .495 | .3888 |
| | HR 14 | .083 | .459 | .4805 |
| **¾x** | | | | |
| | CR 22 | .028 | .694 | .2159 |
| | CR 20 | .035 | .680 | .2673 |
| | CR 18 | .049 | .652 | .3668 |
| | CR 16 | .065 | .620 | .4755 |
| **⅞x** | | | | |
| | CR 20 | .035 | .805 | .3140 |
| | CR 18 | .049 | .777 | .4323 |
| | CR 16 | .065 | .745 | .5623 |
| | HR 14 | .083 | .709 | .7021 |
| **1x** | | | | |
| | CR 22 | .028 | .944 | .2907 |
| | CR 20 | .035 | .930 | .3607 |
| | CR 18 | .049 | .902 | .4977 |
| | CR 16 | .065 | .870 | .6491 |
| | HR 14 | .083 | .834 | .8129 |
| | HR 13 | .095 | .810 | .9182 |
| | HR 11 | .120 | .760 | 1.128 |
| **1⅛x** | | | | |
| | CR 20 | .035 | 1.055 | .4074 |
| | CR 18 | .049 | 1.027 | .5631 |
| | CR 16 | .065 | .995 | .7359 |
| | HR 11 | .120 | .885 | 1.288 |
| **1¼x** | | | | |
| | CR 20 | .035 | 1.180 | .4542 |
| | CR 18 | .049 | 1.152 | .6285 |
| | CR 16 | .065 | 1.120 | .8226 |
| | HR 14 | .083 | 1.084 | 1.034 |
| | HR 13 | 095 | 1.060 | 1.172 |
| | HR 11 | .120 | 1.010 | 1.448 |
| **1 5/16x** | | | | |
| | CR 16 | .065 | 1.183 | .8664 |
| **1⅜x** | | | | |
| | CR 20 | .035 | 1.305 | .5009 |
| | CR 18 | .049 | 1.277 | .6939 |
| | CR 16 | .065 | 1.245 | .9094 |
| | HR 14 | .083 | 1.209 | 1.145 |
| | HR 11 | .120 | 1.135 | 1.608 |
| **1½x** | | | | |
| | CR 20 | .035 | 1.430 | .5476 |
| | CR 18 | .049 | 1.402 | .7593 |
| | CR 16 | .065 | 1.370 | .9962 |
| | HR 14 | .083 | 1.334 | 1.256 |
| | HR 11 | .120 | 1.260 | 1.769 |
| **1⅝x** | | | | |
| | CR 20 | .035 | 1.555 | .5943 |
| | CR 18 | .049 | 1 527 | .8248 |
| | CR 16 | .065 | 1.495 | 1.083 |
| | HR 14 | .083 | 1.459 | 1.367 |
| | HR 11 | .120 | 1.385 | 1.929 |
| **1¾x** | | | | |
| | CR 20 | .035 | 1.680 | .6411 |
| | CR 18 | .049 | 1.652 | .8902 |
| | CR 16 | .065 | 1.620 | 1.170 |
| | HR 14 | .083 | 1.584 | 1.478 |
| | HR 11 | .120 | 1.510 | 2.089 |
| **1⅞x** | | | | |
| | CR 20 | .035 | 1.805 | .6878 |
| | CR 18 | .049 | 1.777 | .9556 |
| | CR 16 | .065 | 1.745 | 1.257 |
| | HR 14 | .083 | 1.709 | 1.589 |
| | HR 11 | .120 | 1.635 | 2.249 |

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## WELDED MECHANICAL TUBING

*(Continued)*

| Size O.D. | Average Wall B.W. Ga. | Dec. Inches | Nominal I.D. | Wt. Per Ft. in Lbs. |
|---|---|---|---|---|
| (Continued) | | | | |
| **2x** | | | | |
| | CR 20 | .035 | 1.930 | .7345 |
| | CR 18 | .049 | 1.902 | 1.021 |
| | CR 16 | .065 | 1.870 | 1.343 |
| | HR 14 | .083 | 1.834 | 1.699 |
| | HR 13 | .095 | 1.810 | 1.933 |
| | HR 11 | .120 | 1.760 | 2.409 |
| | HR 5/32 | .156 | 1.687 | 3.072 |
| | HR 7 | .180 | 1.640 | 3.499 |
| **2⅛x** | | | | |
| | CR 20 | .035 | 2.055 | .7812 |
| | CR 18 | .049 | 2.027 | 1.086 |
| | CR 16 | .065 | 1.995 | 1.430 |
| | HR 14 | .083 | 1.959 | 1.810 |
| **2¼x** | | | | |
| | CR 20 | .035 | 2.180 | .8280 |
| | CR 18 | .049 | 2.152 | 1.152 |
| | CR 16 | .065 | 2.120 | 1.517 |
| | HR 14 | .083 | 2.084 | 1.921 |
| | HR 11 | .120 | 2.010 | 2.730 |
| | HR 7 | .180 | 1.875 | 3.979 |
| **2⅜x** | | | | |
| | CR 18 | .049 | 2.277 | 1.217 |
| | CR 16 | .065 | 2.245 | 1.604 |
| | HR 14 | .083 | 2.209 | 2.032 |
| | HR 5/32 | .156 | 2.062 | 3.697 |
| | HR 7 | .180 | 2.015 | 4.220 |
| **2½x** | | | | |
| | CR 20 | .035 | 2.430 | .9214 |
| | CR 18 | .049 | 2.402 | 1.283 |
| | CR 16 | .065 | 2.370 | 1.690 |
| | HR 14 | .083 | 2.334 | 2.143 |
| | HR 11 | .120 | 2.260 | 3.050 |
| | HR 7 | .180 | 2.140 | 4.460 |
| **2⅝x** | | | | |
| | CR 18 | .049 | 2.527 | 1.348 |
| | CR 16 | .065 | 2.495 | 1.777 |
| **2¾x** | | | | |
| | CR 18 | .049 | 2.652 | 1.413 |
| | CR 16 | .065 | 2.620 | 1.864 |
| | HR 14 | .083 | 2.584 | 2.364 |
| | HR 11 | .120 | 2.510 | 3.371 |
| **2⅞x** | | | | |
| | CR 18 | .049 | 2.777 | 1.479 |
| | CR 16 | .065 | 2.745 | 1.951 |
| **3x** | | | | |
| | CR 18 | .049 | 2.902 | 1.544 |
| | CR 16 | .065 | 2.870 | 2.037 |
| | HR 14 | .083 | 2.834 | 2.586 |
| | HR 11 | .120 | 2.760 | 3.691 |
| | HR 7 | .180 | 2.640 | 5.421 |
| | HR ¼ | .250 | 2.500 | 7.343 |
| **3⅛x** | | | | |
| | CR 16 | .065 | 2.995 | 2.124 |
| | HR 14 | .083 | 2.959 | 2.697 |
| **3¼x** | | | | |
| | CR 16 | .065 | 3.120 | 2.211 |
| | HR 13 | .095 | 3.060 | 3.201 |
| | HR 11 | .120 | 3.010 | 4.011 |
| **3½x** | | | | |
| | CR 16 | .065 | 3.370 | 2.385 |
| | HR 14 | .083 | 3.334 | 3.029 |
| | HR 11 | .120 | 3.260 | 4.332 |
| | HR 7 | .180 | 3.140 | 6.382 |
| | HR ¼ | .250 | 3.000 | 8.678 |
| **3⅝x** | | | | |
| | CR 16 | .065 | 3.495 | 2.471 |
| **3¾x** | | | | |
| | CR 16 | .065 | 3.620 | 2.558 |
| **4x** | | | | |
| | CR 16 | .065 | 3.870 | 2.732 |
| | HR 14 | .083 | 3.834 | 3.472 |
| | HR 11 | .120 | 3.760 | 4.973 |
| | HR 7 | .180 | 3.640 | 7.344 |
| | HR ¼ | .250 | 3.500 | 10.01 |
| **4⅛x** | | | | |
| | CR 16 | .065 | 3.995 | 2.818 |
| **4¼x** | | | | |
| | HR 11 | .120 | 4.010 | 5.293 |
| **4½x** | | | | |
| | HR 11 | .120 | 4.260 | 5.613 |
| | HR ¼ | .250 | 4.000 | 11.35 |
| **5x** | | | | |
| | HR 11 | .120 | 4.760 | 6.254 |
| | HR 7 | .180 | 4.640 | 9.266 |
| | HR ¼ | .250 | 4.500 | 12.68 |
| **5½x** | | | | |
| | HR ¼ | .250 | 5.000 | 14.02 |
| **6x** | | | | |
| | HR 11 | .120 | 5.760 | 7.536 |
| | HR 7 | .180 | 5.640 | 11.19 |
| | HR ¼ | .250 | 5.500 | 15.35 |

## SQUARE TUBING

**Mechanical and Structural**

Square tubing has several advantages that recommend it for use as a basic structural shape. Low cost is one. Light weight coupled with high strength is another. And, made of low carbon steel, it readily welds, forms, punches and drills. Its square shape with right angles and flat surfaces simplifies fabrication.

The cold rolled welded type has a No. 2 strip finish, excellent for high gloss painting. The hot rolled welded has a bright finish to which paint readily adheres. The cold drawn seamless is precision made and has sharper corners. It is especially suitable for machined parts. The smooth, bright surface is also suitable for painting.

### ELECTRIC RESISTANCE WELDED SQUARES

**Cold Rolled and Hot Rolled Bright Finish**

*Low Carbon • MT 1010*

**Random Lengths: 5 to 24 Ft.**

| Size Inches | Average Wall B.W. Ga. | Average Wall Dec. Inches | Nominal I.D. | Wt. per Ft., Lbs. |
|---|---|---|---|---|
| ½x | | | | |
| | CR 20 | .035 | .430 | .221 |
| | CR 18 | .049 | .402 | .301 |
| | CR 16 | .065 | .370 | .384 |
| ⅝x | | | | |
| | CR 18 | .049 | .527 | .384 |
| | CR 16 | .065 | .495 | .495 |
| ¾x | | | | |
| | CR 20 | .035 | .680 | .340 |
| | CR 18 | .049 | .652 | .467 |
| | CR 16 | .065 | .620 | .605 |
| | HR 11 | .120 | .510 | 1.028 |
| ⅞x | | | | |
| | CR 18 | .049 | .777 | .550 |
| | CR 16 | .065 | .745 | .716 |
| 1x | | | | |
| | CR 20 | .035 | .930 | .459 |
| | CR 18 | .049 | .902 | .634 |
| | CR 16 | .065 | .870 | .826 |
| | HR 14 | .083 | .834 | 1.035 |
| | HR 12 | .109 | .782 | 1.135 |
| | HR 11 | .120 | .760 | 1.436 |
| 1¼x | | | | |
| | CR 20 | .035 | 1.180 | .578 |
| | CR 18 | .049 | 1.152 | .800 |
| | CR 16 | .065 | 1.120 | 1.048 |
| | HR 14 | .083 | 1.084 | 1.317 |
| | HR 11 | .120 | 1.010 | 1.844 |
| 1½x | | | | |
| | CR 18 | .049 | 1.402 | .967 |
| | CR 16 | .065 | 1.370 | 1.268 |
| | HR 14 | .083 | 1.334 | 1.600 |
| | HR 11 | .120 | 1.260 | 2.252 |
| 1¾x | | | | |
| | CR 16 | .065 | 1.620 | 1.489 |
| | HR 14 | .083 | 1.584 | 1.881 |
| | HR 11 | .120 | 1.510 | 2.660 |
| 2x | | | | |
| | CR 16 | .065 | 1.870 | 1.710 |
| | HR 14 | .083 | 1.834 | 2.164 |
| | HR 13 | .095 | 1.810 | 2.461 |
| | HR 11 | .120 | 1.760 | 3.068 |
| | HR 7 | .180 | 1.640 | 4.455 |
| 2½x | | | | |
| | HR 14 | .083 | 2.334 | 2.728 |
| | HR 11 | .120 | 2.260 | 3.884 |
| 3x | | | | |
| | HR 11 | .120 | 2.760 | 4.700 |
| | HR 7 | .180 | 2.624 | 6.900 |
| 3½x | | | | |
| | HR 11 | .120 | 3.260 | 5.515 |
| 4x | | | | |
| | HR 11 | .120 | 3.760 | 6.332 |
| | HR 7 | .180 | 3.624 | 9.350 |

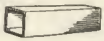
### COLD DRAWN SEAMLESS SQUARES

In our Cleveland plant

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1¼x3/16 | .188 | .875 | 2.705 | 2x¼ | .250 | 1.500 | 5.949 |

## STRUCTURAL TUBING

### SQUARE—HOT ROLLED
### BUTT WELDED PIPE



**Random Lengths: 18 to 22 Ft.**

| Size in Inches | Nom. Wall Thickness | Wt. per Ft. in Lbs. | Size in Inches | Nom. Wall Thickness | Wt. per Ft. in Lbs. |
|---|---|---|---|---|---|
| 1** | .073 | 0.92 | 2 | .188 | 4.63 |
| 1 | .125 | 1.44 | 2½ | .188 | 5.60 |
| 1¼ | .135 | 2.20 | 2½ | .250 | 7.35 |
| 1½ | .140 | 2.70 | 3* | .120 | 4.89 |
| 1½ | .188 | 3.05 | 3* | .180 | 7.19 |
| 2 | .145 | 3.70 | 4* | .180 | 9.74 |

* These sizes are Hot Rolled Welded Mechanical. They are not Butt Welded. Available in Random Lengths 5 to 24 Feet.

** This size is an Elyria structural grade.

### RECTANGULAR—HOT ROLLED
### BUTT WELDED PIPE

**Random Lengths: 18 to 22 Ft.**

| Size in Inches | Nom. Wall Thickness | Wt. per Ft. in Lbs. |
|---|---|---|
| 2½x1½ | .145 | 3.75 |

## MECHANICAL AND STRUCTURAL TUBING

### RECTANGULAR—HOT ROLLED—BRIGHT FINISH
### ELECTRIC RESISTANCE WELDED

*Inside Welding Flash Removed*

**Random Lengths: 5 to 24 Ft.**

| Size in Inches | Average Wall B.W. Ga. | Average Wall Dec. Inches | Wt. per Ft. in Lbs. | Size in Inches | Average Wall B.W. Ga. | Average Wall Dec. Inches | Wt. per Ft. in Lbs. |
|---|---|---|---|---|---|---|---|
| 1½x1 | 14 | .083 | 1.317 | 3x2 | 11 | .120 | 3.884 |
| 2 x1 | 14 | .083 | 1.600 | 3x2 | 7 | .180 | 5.679 |
| 2 x1½ | 11 | .120 | 2.660 | 4x2 | 14 | .083 | 3.293 |
| 2½x1 | 14 | .083 | 1.881 | 4x2 | 7 | .180 | 6.903 |
| 2½x1½ | 14 | .083 | 2.164 | 4x3 | 7 | .180 | 8.127 |
| 3 x1½ | 11 | .120 | 3.476 | 6x3 | 7 | .180 | 10.575 |
| 3 x2 | 14 | .083 | 2.728 | 6x4 | 7 | .180 | 12.240 |

## STANDARD BLACK PIPE

**Plain Ends**

**Random Lengths: 16 to 22 Ft.**

| Size in Inches | O.D. in Inches | Wall Thick., Inches | Wt. per Ft. in Lbs. | Size in Inches | O.D. in Inches | Wall Thick., Inches | Wt. per Ft. in Lbs. |
|---|---|---|---|---|---|---|---|
| ¼ | .540 | .088 | .42 | 1½ | 1.900 | .145 | 2.72 |
| ⅜ | .675 | .091 | .57 | 2 | 2.375 | .154 | 3.65 |
| ½ | .840 | .109 | .85 | 2½ | 2.875 | .203 | 5.79 |
| ¾ | 1.050 | .113 | 1.13 | 3 | 3.500 | .216 | 7.58 |
| 1 | 1.315 | .133 | 1.68 | 3½ | 4.000 | .226 | 9.11 |
| 1¼ | 1.660 | .140 | 2.27 | 4 | 4.500 | .237 | 10.79 |

## EXTRA HEAVY BLACK PIPE

**Plain Ends**

**Random Lengths: 16 to 22 Ft.**

| Size in Inches | O.D. in Inches | Wall Thick., Inches | Wt. per Ft. in Lbs. | Size in Inches | O.D. in Inches | Wall Thick., Inches | Wt. per Ft. in Lbs. |
|---|---|---|---|---|---|---|---|
| ¼ | .540 | .119 | .54 | 1½ | 1.900 | .200 | 3.63 |
| ⅜ | .675 | .126 | .74 | 2 | 2.375 | .218 | 5.02 |
| ½ | .840 | .147 | 1.09 | 2½ | 2.875 | .276 | 7.66 |
| ¾ | 1.050 | .154 | 1.47 | 3 | 3.500 | .300 | 10.25 |
| 1 | 1.315 | .179 | 2.17 | 3½ | 4.000 | .318 | 12.51 |
| 1¼ | 1.660 | .191 | 3.00 | 4 | 4.500 | .337 | 14.98 |

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A broad range of tubing types and sizes—ready for shipment

# TUBING — STANDARD MFG. TOLERANCES

## ROUND, COLD DRAWN, SEAMLESS STEEL MECHANICAL TUBING

### Explanatory Notes

The outside and inside diameters and wall thickness tolerances apply only to nominal sizes and to unannealed and finished annealed carbon and alloy steel tubing.

Tubing having relatively heavy or light wall in relation to the outside diameter is covered by special tolerances, reference to which is made in the foot-notes of the table.

Finish annealed tubing constitutes the bulk of *cold drawn mechanical tubing*. Tubes which have been given a softer anneal are apt to possess more or less ovality or out-of-roundness, due to warping in annealing, or to the subsequent straightening operations. The higher temperature used in making the softer anneals, with the attendant increase in scale, also affects the accuracy of diameter. Therefore, medium or soft-annealed tubes will not be as close to size as the table indicates, but will not vary from the specified dimensions by more than twice the tolerances given in the preceding table.

Tolerances are applicable only to two dimensions (length excepted). Thus, if outside diameter and wall thickness are specified, the inside diameter may not conform to published tolerances. If outside diameter and inside diameter are specified, the wall thickness may not conform to published tolerances except that the mean or average wall thickness (taking into account the permissible outside diameter and inside diameter tolerances) will not vary more than indicated under Permissible Variations in Wall Thicknesses.

### Example

If a cold drawn tube is specified to be 1.500″ O.D. and 1.250″ I.D., the theoretical wall thickness might be expected to be held to a variation of 10 per cent over or under, or within the limits of 0.1125 to 0.1375″.

However, a nominal O.D. of 1.500″ may vary between 1.500″ and 1.510″ (average 1.505″) and the I.D. may vary between 1.240″ and 1.250″ (average 1.245″), resulting in an average or mean wall thickness of 0.130″ instead of 0.125″. Consequently the wall thickness may vary 10 per cent over or under from the mean of 0.130″, or within the limits of 0.117″ to 0.143″.

Therefore, if the three dimensions O.D., I.D. and wall thickness are specified, it would be impracticable to meet all three of the tolerances specified for them. If, in the above case, all three of the dimensions were specified, a wall thickness tolerance of 0.1125 to 0.1375″ would be required, which is obviously inconsistent with the actual average wall thickness resulting from standard O.D. and I.D. tolerances.

## STANDARD MFG. TOLERANCES—*Continued*

| Group | Size O.D., Inches | Permissible Variations from: Outside Diameter in Inches | | Inside Diameter in Inches | | Wall Thickness, per cent | |
|---|---|---|---|---|---|---|---|
| | | Over | Under | Over | Under | Over | Under |
| 1 | 3/16 to 1/2 excl. | 0.004 | 0 | a,b | a,b | a,b | a,b |
| 2 | 1/2 to 1 1/2 excl. | 0.005c | 0c | 0a,b | 0.005a,b | 10a,b | 10a,b |
| 3 | 1 1/2 to 3 1/2 excl. | 0.010c | 0c | 0a | 0.010a | 10a | 10a |
| 4 | 3 1/2 to 5 1/2 excl. | 0.015 | 0c | 0.005a | 0.015a | 10a | 10a |
| 5 | 5 1/2 to 8 excl. when wall is less than 5% of O.D. | 0.030c | 0.030c | 0.035c | 0.035c | 10 | 10 |
| 6 | 5 1/2 to 8 excl. when wall is 5 to 7.5% of O.D. | 0.020 | 0.020 | 0.025 | 0.025 | 10 | 10 |
| 7 | 5 1/2 to 8 excl. when wall is over 7.5% of O.D. | 0.030 | 0 | 0.015a | 0.030a | 10a | 10a |
| 8 | 8 to 10 3/4 incl. when wall is less than 5% of O.D. | 0.045c | 0.045c | 0.050c | 0.050c | 10 | 10 |
| 9 | 8 to 10 3/4 incl. when wall is 5 to 7.5% of O.D. | 0.035 | 0.035 | 0.040 | 0.040 | 10 | 10 |
| 10 | 8 to 10 3/4 incl. when wall is over 7.5% of O.D. | 0.045 | 0 | 0.15a | 0.040a | 10a | 10a |

(a) For tubes with inside diameter less than 50% of outside diameter or with wall thickness more than 25% of outside diameter, or with wall thickness over 1¼", or weighing more than 90 lb. per ft., which cannot be successfully drawn over a mandrel, the inside diameter may vary over or under by 10% of the wall thickness. The wall thickness may vary 12½% over or under that specified.

(b) For tubes with inside diameter less than ½" (or less than ⅝" when the wall thickness is more than 20% of the outside diameter), which cannot be successfully drawn over a mandrel, the wall thickness may vary 15% over or under that specified and the inside diameter will be governed by the outside diameter and wall thickness variations.

(c) Tubing having a wall thickness less than 3% of the outside diameter cannot be straightened properly without a certain amount of distortion. Consequently such tubes, while having an average outside diameter and inside diameter within the tolerances shown in the table, will require an ovality tolerance of ½% over or under the nominal outside diameter and inside diameter in addition to the tolerances indicated in the table.

**WAREHOUSE TOLERANCES LIMITED TO O.D. AND WALL**
*(Except for Cylinder Tubing specially drawn to O.D.-I.D. dimensions.)*

## STANDARD MFG. TOLERANCES — *Continued*

### Straightness Tolerances

Under standard practice, out-of-straightness tolerances should not exceed the amounts shown in tabular form below. The tolerance for any 3 feet of length is measured with a 3-foot straight edge and the use of a feeler gauge. The total tolerance, that is the maximum curvature at any point in the total length of the tube, is determined by rolling the tube on a surface plate and measuring the curvature with a feeler gauge. The table applies to lengths not over 22 feet.

| Size Limits | Maximum Curvature in any 3 Ft. | Maximum Curvature in Total Lengths | Maximum Curvature for Lengths under 3 Ft. |
|---|---|---|---|
| O.D. 5″ and smaller. Wall thickness, over 3% of O.D., but not over 0.5″ | 0.030″ | $0.030'' \times \frac{\text{No. of Feet of Length}}{3}$ | Ratio of 0.010″ per ft. |
| O.D. over 5″ to 8″, incl. Wall thickness, over 4% of O.D., but not over 0.75″ | 0.045″ | $0.045'' \times \frac{\text{No. of Feet of Length}}{3}$ | Ratio of 0.015″ per ft. |
| O.D. over 8″ to 10¾″, incl. Wall thickness, over 4% of O.D., but not over 1″ | 0.060″ | $0.060'' \times \frac{\text{No. of Feet of Length}}{3}$ | Ratio of 0.020″ per ft. |

The tolerances apply generally to unannealed, finish-annealed and medium annealed cold finished or hot finished tubes of carbon steel up to a maximum of 0.45 per cent carbon and to alloy steel tubes up to a maximum of 0.25 per cent carbon. Tubes having lighter or heavier walls and soft annealed or hardened tubes present straightening difficulties in varying degrees beyond normal, and the tolerance requirements of such tubes should be agreed upon at the time of the ordering.

Tubes for special purposes such as conveyor rolls, etc., requiring straightness tolerances closer than above, demand special straightening operations and inspection which should also be agreed upon at the time of ordering.

## HELPFUL RYERSON LITERATURE

The booklets and bulletins described below contain detailed information on the characteristics, applications, etc. of various steel and allied products. They will gladly be mailed to you upon request. Other Ryerson literature is frequently published, so if you are seeking more data on a product or service not shown here, please write or call us. We are anxious to help you in every way.

**Cold Finished Steel Bars**—This new buyers' guide features a selection chart which compares the costs, strengths, machinability, workability, weldability, etc., of C.F. bars. It also points out the important differences between drawn, turned and turned & ground bars. Tips on how to buy most economically and a list of sizes and shapes in stock add to its usefulness.

**Flame-Cut Plates**—Illustrates the wide range of intricate shapes that are produced with our modern flame-cutting equipment. Also demonstrates its versatility and economy.

**Steel Service for Contractors**—Features our high-bonding reinforcing bar, designed to give greater bond between steel and concrete. Explains our nationwide fabrication service which includes cutting and bending, setting plans and metal tags for quick, accurate placement. Other products described include wire fabric, steel forms, spirals, expanded metal, caisson rings, etc.

**E-Z Cut Plate**—A high manganese, high sulphur plate especially designed for case hardening and free machining. Booklet explains how E-Z Cut can be easily machined with a resulting smooth surface for die bases, jigs, fixtures, etc.

**Metal Working Tools and Machinery**—In addition to a comprehensive catalog illustrating and describing a selected group of machines and tools for metal forming and fabricating, we have a number of bulletins on drills, saws, shears, benders, grinders, rolls, etc., that are job-tested, with performance records you can safely depend on.

**Tubing**—A number of bulletins explaining and illustrating types, applications, etc., of mechanical tubing; square tubing; Rockrite cylinder finish tubing; Hydraulic Fluid Line Tubing; Stainless Tubing, Pipe, Fittings & Valves; Boiler Tubes; and Plastic Pipe & Tubing.

**Ryertex Industrial Plastic**—A laminated resin textile product widely used for bearings and bushings, also for mechanical parts, panels, silent gears, etc. Explains how Ryertex is made, types available, characteristics and shapes, and how to machine. Also illustrates the combinations of patterns and colors of Ryertex decorative sheets used for counters, table tops, paneling, etc.

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## CHEMICAL ANALYSIS—STAINLESS STEEL

| AISI No. | Carbon | Mn. Max. | Si. Max. | Chromium | Nickel | Other Elements |
|---|---|---|---|---|---|---|
| **201** | .15 Max. | ** | 1.00 | 16.00/18.00 | 3.50/ 5.50 | N 0.25 Max. |
| **202** | .15 Max. | ** | 1.00 | 17.00/19.00 | 4.00/ 6.00 | N 0.25 Max. |
| **301** | .15 Max. | 2.00 | 1.00 | 16.00/18.00 | 6.00/ 8.00 | |
| **302** | .15 Max. | 2.00 | 1.00 | 17.00/19.00 | 8.00/10.00 | |
| **302B** | .15 Max. | 2.00 | 2.00/ 3.00 | 17.00/19.00 | 8.00/10.00 | |
| **303** | .15 Max. | 2.00 | 1.00 | 17.00/19.00 | 8.00/10.00 | * |
| **304** | .08 Max. | 2.00 | 1.00 | 18.00/20.00 | 8.00/12.00 | |
| **304L** | .03 Max. | 2.00 | 1.00 | 18.00/20.00 | 8.00/12.00 | |
| **305** | .12 Max. | 2.00 | 1.00 | 17.00/19.00 | 10.00/13.00 | |
| **308** | .08 Max. | 2.00 | 1.00 | 19.00/21.00 | 10.00/12.00 | |
| **309** | .20 Max. | 2.00 | 1.00 | 22.00/24.00 | 12.00/15.00 | |
| **309S** | .08 Max. | 2.00 | 1.00 | 22.00/24.00 | 12.00/15.00 | |
| **309SCb** | .08 Max. | 2.00 | 1.00 | 22.00/24.00 | 12.00/15.00 | Cb. 10xC. Min. |
| **310** | .25 Max. | 2.00 | 1.50 | 24.00/26.00 | 19.00/22.00 | |
| **310S** | .08 Max. | 2.00 | 1.50 | 24.00/26.00 | 19.00/22.00 | |
| **314** | .25 Max. | 2.00 | 1.50/ 3.00 | 23.00/26.00 | 19.00/22.00 | |
| **316** | .08 Max. | 2.00 | 1.00 | 16.00/18.00 | 10.00/14.00 | Mo. 2.00/3.00 |
| **316L** | .03 Max. | 2.00 | 1.00 | 16.00/18.00 | 10.00/14.00 | Mo. 2.00/3.00 |
| **317** | .08 Max. | 2.00 | 1.00 | 18.00/20.00 | 11.00/15.00 | Mo. 3.00/4.00 |
| **318** | .08 Max. | 2.50 | 1.00 | 17.00/19.00 | 13.00/15.00 | Mo. 2.00/3.00 Cb. 10xC. Min., 1.00 Max. |
| **321** | .08 Max. | 2.00 | 1.00 | 17.00/19.00 | 9.00/12.00 | Ti. 6xC. Min. |
| **347** | .08 Max. | 2.00 | 1.00 | 17.00/19.00 | 9.00/13.00 | Cb.+Ta. 10xC Min. Tantalum .10 Max. |
| **348** | .08 Max. | 2.00 | 1.00 | 17.00/19.00 | 9.00/13.00 | Cb. 10xC. Min. Tantalum .10 Max. |
| **403** | .15 Max. | 1.00 | 0.50 | 11.50/13.00 | | |
| **405** | .08 Max. | 1.00 | 1.00 | 11.50/14.50 | | Alum. 10/.30 |
| **410** | .15 Max. | 1.00 | 1.00 | 11.50/13.50 | | |
| **414** | .15 Max. | 1.00 | 1.00 | 11.50/13.50 | 1.25/ 2.50 | |
| **416** | .15 Max. | 1.25 | 1.00 | 12.00/14.00 | | * |
| **420** | Over .15 | 1.00 | 1.00 | 12.00/14.00 | | |
| **420F** | Over .15 | 1.25 | 1.00 | 12.00/14.00 | | * |
| **430** | .12 Max. | 1.00 | 1.00 | 14.00/18.00 | | |
| **430F** | .12 Max. | 1.25 | 1.00 | 14.00/18.00 | | * |
| **431** | .20 Max. | 1.00 | 1.00 | 15.00/17.00 | 1.25/ 2.50 | |
| **440A** | .60/ .75 | 1.00 | 1.00 | 16.00/18.00 | | Mo. 0.75 Max. |
| **440B** | .75/ .95 | 1.00 | 1.00 | 16.00/18.00 | | Mo. 0.75 Max. |
| **440C** | .95/1.20 | 1.00 | 1.00 | 16.00/18.00 | | Mo. 0.75 Max. |
| **440F** | .95/1.20 | 1.25 | 1.00 | 16.00/18.00 | | * |
| **442** | .25 Max. | 1.00 | 1.00 | 18.00/23.00 | | |
| **446** | .20 Max. | 1.50 | 1.00 | 23.00/27.00 | | $N_2$ 0.25 Max. |

*Type 303, 416, 420 F, 430 F and 440 F—Phosphorus or Sulphur .07 Min., Molybdenum or Zirconium .60 Max.

**Manganese range on Type 201 is 5.50/7.50; on Type 202, 7.50/10.00. Phosphorus content is 0.06 max.; Sulphur 0.03 max.

Note: Phosphorus .04 Max. and Sulphur .03 Max.—all Types except 201, 202, 303, 416, 420 F, 430 F, and 440 F.

**Direct mill shipments.** We will be glad to ship your special stainless needs from our mill on a mill price basis.

### STANDARD STAINLESS STEEL SHEET & PLATE FINISHES

No. 1 Finish—Hot rolled, annealed and pickled.

No. 2B Finish—Annealed, pickled, and bright cold rolled.

No. 2D Finish—Annealed, pickled and dull cold rolled.

No. 3 Finish—Intermediate polish on one side or both sides.

No. 4 Finish—Standard polish on one side or both sides.

## A.S.T.M. SPECIFICATIONS — STAINLESS STEEL

Listed below is a summary of the important requirements of the A.S.T.M. specifications for stainless sheets, plates, pipe, and tubing. For more detailed information refer to A.S.T.M. Standards or contact your nearby Ryerson plant.

### A-240-54 *Sheets and Plates*

**Chemical Requirements**

| | Grade "S" Type 304 Modified | | Grade "M" Type 316 Modified | |
|---|---|---|---|---|
| Carbon | .08 | Max. | .08 | Max. |
| Manganese | 2.50 | " | 2.50 | " |
| Phosphorus | .035 | " | .035 | " |
| Sulphur | .030 | " | .030 | " |
| Silicon | .85 | " | .85 | " |
| Chromium | 18.00 | Min. | 17.00 | Min. |
| Nickel | 8.00 | " | 10.00 | " |
| Molybdenum | ... | | 2.00 | " |

**Mechanical Properties**

| | | | | |
|---|---|---|---|---|
| Tensile Strength | 75,000psi | Min. | 75,000psi | Min. |
| Yield Strength | 30,000psi | " | 30,000psi | " |
| Elong. in 2" | 30% | " | 30% | " |
| Brinell Hardness | 202 | Max. | 217 | Max. |
| Rockwell Hardness | B88 | " | B95 | " |
| Cold Bend | 180° | | 180° | |

**Intergranular Corrosion Test**—Corrosion test specimens should be boiled for 72 hours in Strauss reagent. Following this treatment, material should not have lost its metallic ring and should also withstand Bend Test as outlined in the specifications.

### A-312-55T *Seamless and Welded Pipe*

**Chemical Requirements TP304**

| | | | |
|---|---|---|---|
| Carbon | .08 Max. | Silicon | .75 Max. |
| Manganese | 2.00 Max. | Nickel | 8.00/11.00 |
| Phosphorus | .03 Max. | Chromium | 18.00/20.00 |
| Sulphur | .03 Max. | | |

**Mechanical Properties**

Tensile Str. 75,000 psi Min. Yield Point 30,000 psi Min.
*See Spec. for Elongation Limits, Bend Test and Flattening Test.*

**Hydrostatic Test**—Shall be tested to a hydrostatic pressure which will produce a stress 50% of the minimum Yield Point specified above except it shall not exceed 2500 psi for nominal sizes 3" and under or 2800 psi for over 3". See specification for elongation limits, bend tests and flattening tests.

### A-269-55 *Seamless and Welded Tubing*

**Chemical Requirements**

| | TP304 | TP316 | | TP304 | TP316 |
|---|---|---|---|---|---|
| Carbon | .08 Max. | .08 Max. | Silicon | .75 Max. | .75 Max. |
| Mang. | 2.00 Max. | 2.00 Max. | Nickel | 8.0/11.0 | 11.0/14.0 |
| Phosph. | .03 Max. | .03 Max. | Chrom. | 18.0/20.0 | 16.0/18.0 |
| Sulphur | .03 Max. | .03 Max. | Moly. | | 2.0/ 3.0 |

**Hydrostatic Test**—Shall be tested at a min. hydrostatic pressure of 1000 psi provided it doesn't exceed 15,000 psi fibre stress. Otherwise use test pressure to produce 15,000 psi fibre stress.

## STAINLESS SHEETS

**TYPE 202** No. 2B Finish—Cold Rolled, Annealed & Pickled
**TYPE 302** No. 2B Finish—Annealed, Pickled & Cold Rolled
No. 3 Finish one side (Intermediate Polish)
No. 4 Finish one side (Standard polish)
*(See page 163 for Aircraft Quality Sheets)*
**TYPE 304** No. 1 Finish—Hot Rolled, Annealed & Pickled
MS-56 and ASTM A-240-54, Grade S
No. 2B Finish—Cold Rolled, Annealed & Pickled
MIL-S-854, Class I, Condition A, Finish 2 and
ASTM A-240-54, Grade S

| Stainless Ga. & Size in Inches | Est. wt. per Sheet | 202 | 302 | | 304 | |
|---|---|---|---|---|---|---|
| | | No. 2B | No. 2B and 3 | No. 4 | No. 1* | No. 2B |
| **10 Ga.** (.141") 5.906† | | | | | | |
| 36x120 | 177.2 | | X | X | | X |
| 48x120 | 236.2 | | X | X | X | X |
| 60x120 | 295.3 | | X | | | |
| 72x144 | 425.2 | | | | | X |
| **11 Ga.** (.125") 5.250† | | | | | | |
| 36x 96 | 126.0 | | X | X | | X |
| 36x120 | 157.5 | | X | X | X | X |
| 48x 96 | 168.0 | | | | | Phil. |
| 48x120 | 210.0 | | X | X | X | X |
| 48x144 | 252.0 | | X | | | X |
| 60x144 | 315.0 | | | | X | Phil. |
| 72x144 | 378.0 | | | | | Cinc. |
| **12 Ga.** (.109") 4.594† | | | | | | |
| 36x 96 | 110.3 | | X | X | | X |
| 36x120 | 137.8 | | X | X | | X |
| 42x120 | 160.8 | | X | X | | |
| 48x 96 | 146.9 | | N.Y. | | | Cinc. |
| 48x120 | 183.8 | | X | X | X | X |
| 54x120 | 206.7 | | | Pgh. | | |
| 60x 96 | 183.8 | | | | | X |
| 60x120 | 229.7 | | X | X | | |
| 60x144 | 275.6 | | X | | X | Buff. |
| 72x144 | 330.8 | | | | | Cinc. |
| **13 Ga.** (.094") 3.938† | | | | | | |
| 36x 96 | 94.5 | | St.L. | | | X |
| 36x120 | 118.1 | | X | N.Y. | X | |
| 42x120 | 137.8 | | | | | Buff. |
| 48x120 | 157.5 | | X | N.Y. | X | Clev. |
| 60x 96 | 157.5 | | | | | X |
| 72x144 | 283.5 | | | | | Phil. |
| **14 Ga.** (.078") 3.281† | | | | | | |
| 30x120 | 82.0 | | X | X | | Buff. |
| 36x 96 | 78.7 | | X | X | | X |
| 36x120 | 98.4 | X | X | X | X | X |
| 42x120 | 114.8 | | X | X | | |
| 48x 96 | 104.9 | | X | N.Y. | | Cinc. |
| 48x120 | 131.2 | X | X | X | X | X |
| 48x144 | 157.5 | | X | X | | X |
| 60x120 | 164.1 | | | X | | |
| 60x144 | 196.9 | | X | X | X | X |
| 72x144 | 236.2 | | | | | Cinc. |
| **16 Ga.** (.063") 2.625† | | | | | | |
| 30x 96 | 52.5 | | St.L. | X | | Phil. |
| 30x120 | 65.6 | | X | X | | X |
| 36x 96 | 63.0 | | X | X | | X |

*(Continued)*

* In our Buffalo plant. † Weight of gauge in Lbs. Sq. Ft.

## STAINLESS SHEETS, *Continued* AL

| Stainless Ga. & Size in Inches | Est. wt. per Sheet | 202 | 302 | | 304 | |
|---|---|---|---|---|---|---|
| | | No. 2B | No. 2B and 3 | No. 4 | No. 1 | No. 2B |
| **16 Ga.** (.063") 2.625† | | | | | | |
| 36x120 | 78.8 | X | X | X | | X |
| 42x120 | 91.8 | .. | X | X | .. | .. |
| 48x 96 | 84.0 | .. | X | X | .. | Cinc. |
| 48x120 | 105.0 | X | X | X | Buff. | X |
| 48x144 | 126.0 | | X | | | |
| 54x120 | 118.1 | .. | St.L. | .. | .. | .. |
| 56x120 | 122.5 | .. | X | .. | .. | .. |
| 60x120 | 131.3 | .. | .. | X | .. | .. |
| 60x144 | 157.5 | .. | .. | .. | .. | X |
| 72x144 | 189.0 | | | | | Cinc. |
| **18 Ga.** (.050") 2.100† | | | | | | |
| 30x 96 | 42.0 | | N.Y. | X | | |
| 30x120 | 52.5 | .. | X | X | .. | .. |
| 36x 96 | 50.4 | .. | X | X | .. | X |
| 36x120 | 63.0 | X | X | X | .. | X |
| 42x120 | 73.5 | | N.Y. | N.Y. | | |
| 48x 96 | 67.2 | .. | X | X | .. | Phil. |
| 48x120 | 84.0 | X | X | X | Buff. | X |
| 56x120 | 98.0 | | X | | | |
| **19 Ga.** (.044") 1.837† | | | | | | |
| 36x120 | 55.1 | | X | | | |
| **20 Ga.** (.038") 1.575† | | | | | | |
| 30x 96 | 31.5 | | X | X | | |
| 30x120 | 39.4 | .. | X | X | .. | .. |
| 36x 96 | 37.8 | .. | X | X | .. | Phil. |
| 36x120 | 47.3 | X | X | X | | X |
| 42x120 | 55.1 | .. | N.Y. | St.L. | .. | .. |
| 48x 96 | 50.4 | .. | X | X | .. | .. |
| 48x120 | 63.0 | X | X | X | | X |
| **22 Ga.** (.031") 1.313† | | | | | | |
| 24x 96 | 21.0 | | N.Y. | N.Y. | | |
| 30x 96 | 26.3 | .. | X | X | .. | .. |
| 30x120 | 32.8 | .. | X | X | .. | .. |
| 36x 96 | 31.5 | | X | X | | Phil. |
| 36x120 | 39.4 | X | X | X | .. | .. |
| 48x 96 | 42.0 | .. | X | X | .. | .. |
| 48x120 | 52.5 | | X | X | | |
| **24 Ga.** (.025") 1.050† | | | | | | |
| 24x 96 | 16.8 | | | Det. | | |
| 24x120 | 21.0 | .. | St.L. | St.L. | .. | .. |
| 30x 96 | 21.0 | .. | X | X | .. | .. |
| 30x120 | 26.3 | .. | X | X | .. | .. |
| 36x 96 | 25.2 | | X | X | | |
| 36x120 | 31.5 | X | X | X | .. | .. |
| 48x 96 | 33.6 | .. | X | X | .. | .. |
| 48x120 | 42.0 | | X | X | | |
| **26 Ga.** (.019") .788† | | | | | | |
| 24x 96 | 12.6 | | X | X | | |
| 30x 96 | 15.8 | .. | X | X | .. | .. |
| 30x120 | 19.7 | .. | X | X | .. | .. |
| 36x 96 | 18.9 | .. | X | X | .. | .. |
| 36x120 | 23.6 | X | X | X | .. | .. |
| 48x120 | 31.5 | | X | | | |
| **28 Ga.** (.015") .656† | | | | | | |
| 36x120 | 19.7 | | X | | | |

† Weight of gauge in Lbs. Sq. Ft.

**Type 302 Cold Rolled Strip**—Spring Temper Stock for pressure diaphragms in control valves and similar uses requiring spring temper. ¾ hard, 175,000 lbs. min. Tensile. .0075" thick in 12" coils.

## STAINLESS SHEETS

**TYPE 304L** No. 2B Finish—Annealed, Pickled & Cold Rolled
DuPont Specification SW-820M, Grade 820F

**TYPE 316L** No. 2B Finish—Annealed, Pickled & Cold Rolled
DuPont Specification SW-820M, Grade 820G

| Stainless Ga. & Size in Inches | Est. Wt. per Sheet | 304L No. 2B | 316L No. 2B |
|---|---|---|---|
| **10 Ga.** (.141″) 5.906† | | | |
| 48x120 | 236.2 | X | X |
| **11 Ga.** (.125″) 5.250† | | | |
| 48x120 | 210.0 | X | X |
| **12 Ga.** (.109″) 4.594† | | | |
| 48x120 | 183.8 | X | X |
| **14 Ga.** (.078″) 3.281† | | | |
| 48x120 | 131.2 | X | X |
| **16 Ga.** (.063″) 2.625† | | | |
| 36x120 | 78.8 | X | |
| 48x120 | 105.0 | X | X |

**TYPE 309** No. 1 Finish—Hot Rolled, Annealed

**TYPE 310** No. 2D Finish—Cold Rolled, Annealed and Pickled
AMS-5521B

**TYPE 316** No. 2B Finish—Cold Rolled, Annealed and Pickled
ASTM A-240-54, Grade M and
MIL-S-854, Class 9, Cond. A, Finish 2

**TYPE 321** No. 2D Finish—Annealed, Pickled & Cold Rolled

| Stainless Ga. & Size in Inches | Est. Wt. per Sheet | 309* No. 1 | 310 No. 2D | 316 No. 2B | 321 No. 2D |
|---|---|---|---|---|---|
| **8 Ga.** (.172″) 7.218† | | | | | |
| 48x120 | 288.7 | | | X | |
| **10 Ga.** (.141″) 5.906† | | | | | |
| 36x120 | 177.2 | | | X | |
| 48x120 | 236.2 | X | | X | X |
| **11 Ga.** (.125″) 5.250† | | | | | |
| 36x 96 | 126.0 | | | Buff. | |
| 36x120 | 157.5 | | | X | |
| 48x120 | 210.0 | X | | X | |
| 60x144 | 315.0 | | | Phil. | |
| 72x144 | 378.0 | | | Phil. | |
| **12 Ga.** (.109″) 4.594† | | | | | |
| 36x 96 | 110.3 | | | Buff. | |
| 36x120 | 137.8 | | | X | |
| 48x120 | 183.8 | X | | X | X |
| 60x144 | 275.6 | | | X | |
| **13 Ga.** (.094″) 3.938† | | | | | |
| 48x120 | 157.5 | | | Phil. | |
| **14 Ga.** (.078″) 3.281† | | | | | |
| 36x 96 | 78.7 | | | Buff. | |
| 36x120 | 98.4 | | | X | |
| 48x 96 | 105.0 | | | Phil. | |

*(Continued)*

* In our St. Louis plant or as indicated. † Weight of gauge in Lbs. Sq. Ft.

## STAINLESS SHEETS

| Stainless Ga. & Size in Inches | Est. Wt. per Sheet | 309* No. 1 | 310* No. 2D | 316 No. 2B | 321 No 2D |
|---|---|---|---|---|---|
| *(Continued)* | | | | | |
| **14 Ga.** (.078″) 3.281† | | | | | |
| 48x120 | 131.2 | X | | X | X |
| 60x144 | 196.7 | | | X | |
| **16 Ga.** (.063″) 2.625† | | | | | |
| 36x 96 | 63.0 | | | Buff. | |
| 36x120 | 78.8 | Phil. | X | X | |
| 48x 96 | 84.0 | | | Phil. | |
| 48x120 | 105.0 | X | | X | X |
| 60x144 | 157.5 | | | X | |
| **18 Ga.** (.050″) 2.100† | | | | | |
| 36x 96 | 50.4 | | | Buff. | |
| 36x120 | 63.0 | | X | X | |
| 48x 96 | 67.2 | | | Phil. | |
| 48x120 | 84.0 | | | X | X |
| **20 Ga.** (.038″) 1.575† | | | | | |
| 36x 96 | 37.8 | | | N.Y. | |
| 36x120 | 47.2 | | | X | |
| 48x120 | 63.0 | Clev. | | X | |
| **22 Ga.** (.031″) 1.313† | | | | | |
| 36x 96 | 31.5 | | | N.Y. | |
| 36x120 | 39.4 | | X | X | |
| 48x120 | 52.5 | | | Phil. | |
| **24 Ga.** (.025″) 1.050† | | | | | |
| 36x 96 | 25.2 | | | N.Y. | |
| 36x120 | 31.5 | Clev. | | X | |
| 48x120 | 42.0 | | | X | |
| **26 Ga.** (.019″) .788† | | | | | |
| 36x 96 | 18.9 | | | X | |
| 36x120 | 23.6 | | | X | |

* In our St. Louis plant or as indicated. † Weight of gauge is Lbs. Sq. Ft.

### *AIRCRAFT QUALITY • ASA Decimal Thickness*

**TYPE 302** No. 2B Finish—Cold Rolled, Annealed & Pickled MIL-S-5059A (ASG) Comp. 302

**TYPE 310** No. 2D Finish—Cold Rolled, Annealed & Pickled AMS-5521B

**TYPE 321** No. 2D Finish—Cold Rolled, Annealed & Pickled MIL-S-6721A, Composition Ti and AMS 5510E

| Decimal Thickness in Inches | Width & Length in Inches | Est. Wt. per Sq. Ft. | Est. Wt. per Sheet | 302 No. 2B | 310 No. 2D | 321 No. 2D |
|---|---|---|---|---|---|---|
| .125 | 36x120 | 5.25 | 157.5 | X | | St.L. |
| .112 | 36x120 | 4.70 | 141.0 | X | | |
| .090 | 36x120 | 3.78 | 113.4 | X | | |
| .080 | 36x120 | 3.36 | 100.8 | X | | X |
| .063 | 36x120 | 2.63 | 78.9 | X | St.L. | X |
| .050 | 36x120 | 2.10 | 63.0 | X | St.L. | X |
| .045 | 36x120 | 1.89 | 56.7 | X | | St.L. |
| .036 | 36x120 | 1.51 | 45.3 | X | | X |
| .032 | 36x120 | 1.34 | 40.2 | X | St.L. | X |
| .025 | 36x120 | 1.05 | 31.5 | X | | X |
| .020 | 36x120 | .84 | 25.2 | X | | X |
| .0161 | 36x120 | .67 | 20.1 | X | | X |

NOTE: These are the sizes specified for most aircraft applications. For additional sizes meeting these and other government specs., refer to other tables.

## STAINLESS SHEETS

**TYPE 405** No. 1 Finish—Hot Rolled, Annealed and Pickled

**TYPE 410** No. 2D Finish—Cold Rolled, Annealed and Pickled AMS 5504C.

**TYPE 430** No. 2B Finish—Cold Rolled, Annealed and Pickled
No. 3 Finish one side (Intermediate Finish)
No. 4 Finish one side (Standard Polish)

| Stainless Ga. & Size in Inches | Est. Wt. per Sheet | 405 No. 1 | 410 No. 2D | 430 No. 2B, 3 & 4 |
|---|---|---|---|---|
| **10 Ga.** (.141″) 5.794† | | | | |
| 48x120 | 231.8 | | X | |
| **11 Ga.** (.125″) 5.150† | | | | |
| 48x120 | 206.0 | | X | |
| **12 Ga.** (.109″) 4.506† | | | | |
| 48x120 | 180.2 | | X | |
| **14 Ga.** (.078″) 3.219† | | | | |
| 36x120 | 96.6 | | X | |
| 48x120 | 128.8 | | X | X |
| **16 Ga.** (.063″) 2.575† | | | | |
| 36x 96 | 61.8 | X | | |
| 36x120 | 77.3 | | X | X |
| 48x120 | 103.0 | | X | X |
| **18 Ga.** (.050″) 2.06† | | | | |
| 30x120 | 50.3 | | | X |
| 36x 96 | 49.4 | | | X |
| 36x120 | 61.8 | | | X |
| 48x120 | 82.4 | | | X |
| **20 Ga.** (.038″) 1.545† | | | | |
| 30x120 | 38.6 | | | X |
| 36x 96 | 37.1 | | | X |
| 36x120 | 46.4 | | | X |
| 48x120 | 61.8 | | | X |
| **22 Ga.** (.031″) 1.288† | | | | |
| 30x120 | 32.2 | | | X |
| 36x 96 | 30.9 | X | | X |
| 36x120 | 38.6 | | | X |
| 48x120 | 51.5 | | | X |
| **24 Ga.** (.025″) 1.030† | | | | |
| 30x120 | 25.8 | | | X |
| 36x 96 | 24.7 | | | X |
| 36x120 | 30.9 | | | X |
| 48x120 | 41.2 | | | X |
| **26 Ga.** (.109″) 0.772† | | | | |
| 30x120 | 19.3 | | | X |
| 36x 96 | 18.6 | | | X |
| 36x120 | 23.2 | | | X |

† Weight of gauge in Lbs. Sq. Ft.

### OTHER STAINLESS PRODUCTS

*You'll find more stainless products listed and described in other sections of this comprehensive steel catalog.*

**Expanded Stainless Sheets** are supplied in many styles and sizes in standard and flattened types of expanded metal. Refer to pages 54 and 55 for sizes and styles.

**Perforated Stainless Sheets and Plates** are perforated to your specifications in unlimited varieties of patterns and sizes. Refer to page 53.

**Formed Stainless Shapes** are made to order from stainless sheets and plates on press brake equipment into channels, angles, vees, moldings, etc. Sketches and ordering information are on page 41.

## STAINLESS SHEETS AND STRIP

***Aircraft Quality—High Tensile***

**TYPE 301**
**MIL-S-5059A (ASG)**

| Decimal Thickness in Inches | Size in Inches | Est. Wt. per Sq. Ft. | Est. Wt. per Sheet |
|---|---|---|---|
| **¼ Hard Temper** In our Los Angeles plant | | | |
| .125 | 36x120 | 5.25 | 157.5 |
| .112 | 36x120 | 4.70 | 141.0 |
| .090 | 36x120 | 3.78 | 113.4 |
| .080 | 36x120 | 3.36 | 100.8 |
| .063 | 36x120 | 2.63 | 78.9 |
| .050 | 36x120 | 2.10 | 63.0 |
| .045 | 36x120 | 1.89 | 56.7 |
| .040 | 36x120 | 1.68 | 50.4 |
| .036 | 36x120 | 1.51 | 45.3 |
| .032 | 36x120 | 1.34 | 40.2 |
| .025 | 36x120 | 1.05 | 31.5 |
| .020 | 36x120 | .84 | 25.2 |
| .0161 | 36x120 | .68 | 20.4 |
| **½ Hard Temper** In our St. Louis plant | | | |
| .125 | 36x120 | 5.25 | 157.5 |
| .090 | 36x120 | 3.78 | 113.4 |
| .080 | 36x120 | 3.36 | 100.8 |
| .063 | 36x120 | 2.63 | 78.9 |
| .050 | 36x120 | 2.10 | 63.0 |
| .045 | 36x120 L.A. | 1.89 | 56.7 |
| .042 | 36x120 | 1.76 | 52.8 |
| .040 | 36x120 L.A. | 1.68 | 50.4 |
| .036 | 36x120 L.A. | 1.51 | 45.3 |
| .032 | 36x120 | 1.34 | 40.2 |
| .025 | 36x120 | 1.05 | 31.5 |
| .020 | 36x120 | .84 | 25.2 |
| .0161 | 36x120 | .68 | 20.4 |
| **Full Hard Temper** In our Los Angeles plant | | | |
| .063 | 23 15/16x120 | 2.63 | 52.5 |
| .050 | 23 15/16x120 | 2.10 | 41.9 |
| .040 | 23 15/16x120 | 1.68 | 33.5 |
| .036 | 23 15/16x120 | 1.51 | 30.1 |
| .032 | 23 15/16x120 | 1.34 | 26.8 |
| .025 | 23 15/16x120 | 1.05 | 21.0 |
| .020 | 23 15/16x120 | .84 | 16.8 |
| .0161 | 23 15/16x120 | .68 | 13.6 |

### ALL-SOL SOLDERING FLUX

A special flux used in soldering 18-8 Stainless Alloys. All-Sol is particularly well suited for use on all hard-to-solder metals except aluminum. In pint, half gallon and gallon containers.

### STAINLESS STEEL POLISHING POWDER

Excellent for removing heat tint after soldering. Will not scratch, leaves surface bright. In 1 or 5 lb. cans.

## STAINLESS PLATES

**Hot Rolled, Annealed and Pickled**

**TYPE 302** Identification Color: Yellow

**TYPE 304** Identification Color: Green
ASTM A-240-54, Grade S and DuPont Specification 819M, Grade 819A

**TYPE 304L** Identification Color: Gold
DuPont Spec. SW 820M, Grade 820F and General Electric (AEC) Spec. HWS-8061-S

**TYPE 309** Identification Color: Brown
Hot Rolled, Annealed

**TYPE 310** Identification Color: Red
Hot Rolled, Annealed

| Thickness & Size in Inches | 302 | 304 | 304L | 309 310 |
|---|---|---|---|---|
| 3/16x 36x 96 | X | X | | |
| 36x120 | X | X | X | |
| 48x120* | X | X | X | |
| 60x144 | X | X | | |
| 72x144 | | X | | |
| 72x192 | | X | X | |
| 86x260† | | | | X |
| 105x260† | X | X | X | |
| 1/4x 36x120 | X | X | X | |
| 48x120 | X | X | X | |
| 60x144 | X | X | | |
| 72x144 | | X | | |
| 72x192 | | X | X | |
| 105x260† | X | X | X | X |
| 5/16x105x260† | | X | X | |
| 3/8x 48x120 | X | X | X | |
| 60x144 | X | X | | |
| 72x192 | | X | X | |
| 105x260† | X | X | X | X |
| 1/2x 36x120 | X | X | X | |
| 60x144 | X | X | | |
| 72x144 | | X | | |
| 105x260† | X | X | X | X |
| 5/8x105x260† | | X | X | |
| 3/4x105x260† | | X | X | |
| 7/8x105x260† | | X | X | |
| 1 x105x240† | | X | X | |
| 1 1/4x105x270† | | X | X | |
| 1 1/2x105x270† | | X | X | |
| 1 3/4x105x250† | | X | X | |
| 2 x 80x240† | | X | X | |

* Finish suitable for polishing.
† Plates up to these maximum sizes are regularly carried in stock.

**STAINLESS PLATE WEIGHTS** In Pounds per Square Foot

| Size in Inches | Stock or Cut Widths: 80 Inches & Under | Stock or Cut Widths: Over 80 Inches |
|---|---|---|
| 3/16 | 8.295 | 8.566 |
| 1/4 | 10.956 | 11.266 |
| 5/16 | 13.437 | 13.695 |
| 3/8 | 16.123 | 16.433 |
| 1/2 | 21.498 | 21.911 |
| 5/8 | 26.614 | 27.002 |
| 3/4 | 31.937 | 32.402 |
| 7/8 | 37.260 | 37.803 |
| 1 | 42.582 | 43.202 |
| 1 1/4 | 53.228 | 54.004 |
| 1 1/2 | 63.873 | 64.804 |
| 1 3/4 | 74.519 | 75.605 |
| 2 | 85.164 | 86.405 |

## STAINLESS PLATES

**Hot Rolled, Annealed and Pickled**

**TYPE 316** Identification Color: Purple
ASTM A-240-54, Grade M
*(Stock includes Modifications of Type 316)*

**TYPE 316L** Identification Colors: Purple & White
DuPont Spec. SW-820-M, Grade 820G

**TYPE 321** Identification Color: Orange
MIL-S-6721A, AMS-5510E

**TYPE 410** Identification Color: Blue
AMS-5504-C

*For weights, refer to table on bottom of previous page*

| Thickness & Size in Inches | 316 | 316L | 321 | 410 |
|---|---|---|---|---|
| 3/16x 36x 96 | X | | | |
| 36x120 | X | X | L.A. | |
| 48x120* | X | X | L.A. | |
| 60x144 | X | | | |
| 72x192 | X | X | | |
| 86x260† | X | X | | |
| 105x260† | | | | X |
| 1/4x 36x120 | X | X | L.A. | |
| 48x120 | X | X | L.A. | |
| 60x144 | X | | | |
| 72x144 | X | | | |
| 72x192 | X | X | | |
| 105x260† | X | X | | X |
| 5/16x 72x240 | | | X | |
| 105x260† | X | | | |
| 3/8x 48x120 | X | X | | |
| 60x144 | X | | | |
| 72x192 | X | X | | |
| 105x260† | X | X | | X |
| 1/2x 36x120 | X | X | | |
| 60x144 | X | | | |
| 72x144 | X | | | |
| 105x260† | X | X | | |
| 5/8x105x260† | X | | | |
| 3/4x105x260† | X | | | |
| 7/8x105x260† | X | | | |
| 1 x105x240† | X | | | |
| 1 1/4x105x270† | X | | | |
| 1 1/2x105x270† | X | | | |
| 1 3/4x105x250† | X | | | |
| 2 x 80x240† | X | | | |

* Finish suitable for polishing.
† Plates up to these maximum sizes are regularly carried in stock.

**Stainless Clad Plates**—Steel plates clad with Types 304, 316, 410 and 430 stainless steel in 10 and 20% claddings can be furnished promptly from the mill.

**Stainless Heads** are furnished flanged, dished or in special shapes on a quick delivery basis. Refer to plate section for more information.

**Threaded Stainless Bars,** threaded right or left hand to any desired length are quickly made to your order. See building products section for additional information.

## STAINLESS BARS and WIRE

### STAINLESS ROUNDS

**TYPE 303** Identification Color: Black
*(Free Machining)*
MIL-S-7720, Grade FMS—Condition A

**TYPE 304** Identification Color: Green
QQ-S-00763A, Class FS 304 Cond. A and
DuPont SW-819-M, Grade 819A

**TYPE 316** Identification Color: Purple
DuPont SW-819-M, Grade 819D

**TYPE 321** Identification Color: Orange
QQ-S-763A, Class 8, Cond. A & AMS 5645F

Random Lengths: 14 to 16 Ft. (Type 303 1½" & under, 10 to 12 Ft.)

**Annealed and Cold Drawn (Wire)**

| Size in Inches | Est. Wt. per Ft. in Lbs. | 303 | 302 304 | 316 | 321 |
|---|---|---|---|---|---|
| 3/32 | .023 | X | | | |
| 1/8 | .042 | X | X | | |
| 5/32 | .065 | X | | | |
| 3/16 | .094 | X | X | X | X |
| 7/32 | .128 | X | | | |
| 1/4 | .168 | X | X | X | X |
| 9/32 | .212 | X | | | |
| 5/16 | .262 | X | X | X | X |
| 3/8 | .378 | X | X | X | X |
| 7/16 | .514 | X | X | X | X |
| 1/2 | .671 | X | X | X | X |

**Annealed and Centerless Ground**

| | | | | | |
|---|---|---|---|---|---|
| 9/16 | .845 | X | X | Phil. | |
| 5/8 | 1.05 | X | X | X | X |
| 11/16 | 1.27 | X | X | | |
| 3/4 | 1.51 | X | X | X | X |
| 13/16 | 1.77 | X | X | | |
| 7/8 | 2.06 | X | X | X | X |
| 15/16 | 2.36 | X | X | Phil. | |
| 1 | 2.68 | X | X | X | X |
| 1 1/16 | 3.01 | X | | | |
| 1 1/8 | 3.38 | X | X | X | X |
| 1 3/16 | 3.76 | X | | St.L. | |
| 1 1/4 | 4.17 | X | X | X | X |
| 1 5/16 | 4.60 | X | | | |
| 1 3/8 | 5.02 | X | X | X | X |
| 1 7/16 | 5.52 | X | St.L. | Phil. | |
| 1 1/2 | 6.01 | X | X | X | X |
| 1 9/16 | 6.52 | X | | | |
| 1 5/8 | 7.05 | X | X | X | |
| 1 11/16 | 7.60 | X | | | |
| 1 3/4 | 8.18 | X | X | X | X† |
| 1 13/16 | 8.77 | Phil. | | | |

*(Continued)*

† Hot rolled, annealed & pickled.

**Stainless Wire**—Cold Heading Wire, Spring Wire, Weaving Wire, Welding Wire and Rope Wire are supplied in straight chrome and chrome-nickel types on a mill shipment basis.

**Stainless Hammered Forgings**—Our forge shop is well equipped to supply your requirements for bars, rings, discs, hubs, sleeves, etc. Prompt shipment can be made.

## STAINLESS BARS and WIRE

### STAINLESS ROUNDS

**Annealed and Centerless Ground**

| Size in Inches | Est. Wt. per Ft. in Lbs. | 303 | 302 304 | 316 | 321† |
|---|---|---|---|---|---|
| (Continued) | | | | | |
| 1 7/8 | 9.39 | X | X | X | . . |
| 1 15/16 | 10.02 | X | Phil. | Phil. | . . |
| 2 | 10.68 | X | X | X | X |
| 2 1/16 | 11.36 | X | . . | . . | . . |
| 2 1/8 | 12.06 | X | X | X | . . |
| 2 3/16 | 12.78 | X | . . | St.L. | . . |
| 2 1/4 | 13.52 | X | X | X | X |
| 2 5/16 | 14.28 | X | . . | . . | . . |
| 2 3/8 | 15.07 | X | X | X | . . |
| 2 7/16 | 15.86 | X | . . | St.L. | . . |
| 2 1/2 | 16.69 | X | X | X | X |
| 2 9/16 | 17.53 | X | . . | . . | . . |
| 2 5/8 | 18.40 | X | X | X | . . |
| 2 3/4 | 20.19 | X | X | X | X |
| 2 7/8 | 22.07 | X | X | X | . . |
| 2 15/16 | 23.04 | X | . . | St.L. | . . |
| 3 | 24.03 | X | X | X | X |
| 3 1/8 | 26.08 | X | X | X | X |
| 3 1/4 | 28.20 | X | X | X | X |
| 3 3/8 | 30.42 | X | . . | X | . . |
| 3 1/2 | 32.71 | X | X | X | X |
| 3 3/4 | 37.56 | X | . . | . . | . . |
| 4 | 42.73 | X | X | X | X |
| 4 3/8 | 51.11 | . . | . . | . . | X |
| 4 1/2 | 54.07 | X* | X | X | . . |
| 4 7/8 | 63.46 | . . | . . | . . | X |
| 5 | 66.76 | X* | X | X* | . . |
| 5 1/2 | 80.77 | X* | . . | . . | X |
| 6 | 96.14 | X* | X | X* | X |

* These sizes are Hot Rolled, Annealed & rough turned.
† Hot Rolled, Annealed and Pickled.

Stainless bars in stock offer you a large selection of types—including free machining stainless. Sizes range from 3/32" thru 6".

## STAINLESS BARS and WIRE

### STAINLESS ROUNDS

**TYPE 416** Identification Color: Blue
*(Free Machining)*
QQ-S-00763A, Class 416, Type C and AMS-5610E.

**TYPE 440C** Identification Color: White
QQ-S-763A, Cl. 10, Cond. A & AMS-5630C.

Random Lengths: 10 to 12 Ft. (Type 416 1 5/8" & Over, 14 to 16 Ft.)

**Annealed and Cold Drawn (Wire)**

| Size in Inches | Est. Wt. per Ft. in Lbs. | 416 | 440C† |
|---|---|---|---|
| 3/32 | .023 | X | |
| 1/8 | .042 | X | |
| 5/32 | .065 | X | |
| 3/16 | .094 | X | X |
| 7/32 | .128 | X | |
| 1/4 | .167 | X | X |
| 9/32 | .211 | X | |
| 5/16 | .261 | X | |
| 11/32 | .316 | X | |
| 3/8 | .376 | X | X |
| 13/32 | .441 | X | |
| 7/16 | .514 | X | |
| 15/32 | .587 | X | |
| 1/2 | .671 | X | X |

**Annealed and Centerless Ground**

| | | | |
|---|---|---|---|
| 17/32 | .761 | X | |
| 9/16 | .845 | X | |
| 19/32 | .950 | X | |
| 5/8 | 1.05 | X | X |
| 21/32 | 1.16 | X | |
| 11/16 | 1.27 | X | |
| 3/4 | 1.51 | X | X |
| 25/32 | 1.64 | X | |
| 13/16 | 1.77 | X | |
| 7/8 | 2.06 | X | X |
| 15/16 | 2.36 | X | |
| 1 | 2.68 | X | X |
| 1 1/16 | 3.01 | X | |
| 1 1/8 | 3.38 | X | X |
| 1 3/16 | 3.77 | Clev. | |
| 1 1/4 | 4.17 | X | X |
| 1 5/16 | 4.60 | Clev. | |
| 1 3/8 | 5.02 | X | X |
| 1 7/16 | 5.52 | X | |
| 1 1/2 | 6.01 | X | X |
| 1 5/8 | 7.05 | X | |
| 1 11/16 | 7.60 | Clev. | |
| 1 3/4 | 8.18 | X | X* |
| 1 7/8 | 9.39 | X | |
| 1 15/16 | 10.02 | X | |
| 2 | 10.68 | X | X* |
| 2 1/8 | 12.06 | X | X* |
| 2 1/4 | 13.52 | X | X* |
| 2 3/8 | 15.07 | X | X* |
| 2 1/2 | 16.69 | X | X* |

*(Continued)*

* These sizes are Hot Rolled Annealed. † In our New York plant.

## STAINLESS BARS and WIRE

### STAINLESS ROUNDS, *Continued*

**Annealed and Centerless Ground**

| Size in Inches | Est. Wt. per Ft. in Lbs. | 416 | 440C† |
|---|---|---|---|
| 2 5/8 | 18.40 | X | |
| 2 3/4 | 20.19 | X | X |
| 2 7/8 | 22.07 | X | .. |
| 3 | 24.03 | X | X |
| 3 1/8 | 26.08 | X | |
| 3 1/4 | 28.20 | X | X |
| 3 3/8 | 30.42 | X | .. |
| 3 1/2 | 32.71 | X | X |
| 3 3/4 | 37.56 | X | X |
| 4 | 42.73 | X | X |

† In our New York plant. These sizes are Hot Rolled Annealed.

### STAINLESS HEXAGONS and SQUARES

**Annealed and Cold Drawn**

**TYPE 303** Identification Color: Black
*(Free Machining)*
MIL-S-7720, Grade FM S, Cond. A

**TYPE 316** Identification Color: Purple
DuPont SW 819M, Grade 819D

**TYPE 416** Identification Color: Blue
*(Free Machining)*
QQ-S-00763A, Cl. 416, Cond. A & AMS-5610E

Lengths: 10-12′ (Type 316, 14-16′)

| Size in Inches | HEXAGONS Est. Wt. per Ft. | 303 | 316 | 416 | SQUARES Est. Wt. per Ft. | 303 | 416 |
|---|---|---|---|---|---|---|---|
| 1/8 | | | | | .053 | N.Y. | |
| 3/16 | .103 | N.Y. | ... | .. | .120 | Phil. | .. |
| 1/4 | .184 | N.Y. | ... | .. | .214 | X | X |
| 5/16 | .287 | X | ... | X | .334 | X | .. |
| 11/32 | .348 | N.Y. | | | | | |
| 3/8 | .414 | X | X | X | .481 | X | X |
| 7/16 | .564 | X | X | X | ... | ... | .. |
| 1/2 | .736 | X | X | X | .855 | X | X |
| 9/16 | .932 | X | X | X | 1.08 | Phil. | |
| 5/8 | 1.15 | X | X | X | 1.33 | X | X |
| 11/16 | 1.39 | X | N.Y. | X | ... | ... | .. |
| 3/4 | 1.66 | X | X | X | 1.92 | X | X |
| 13/16 | 1.94 | Phil. | X | X | | | |
| 7/8 | 2.25 | X | X | X | 2.62 | X | X |
| 15/16 | 2.58 | Phil. | ... | X | ... | ... | .. |
| 1 | 2.94 | X | X | X | 3.42 | X | X |
| 1 1/16 | 3.32 | X | X | X | | | |
| 1 1/8 | 3.73 | X | X | X | 4.30 | X | X |
| 1 1/4 | 4.60 | X | X | X | 5.31 | X | X |
| 1 5/16 | 5.07 | Phil. | X | .. | ... | ... | .. |
| 1 3/8 | 5.57 | X | | X | | | |
| 1 7/16 | 6.08 | X | ... | X | ... | ... | .. |
| 1 1/2 | 6.62 | X | X | X | 7.65 | X | X |
| 1 5/8 | 7.77 | X | X | X | ... | ... | .. |
| 1 11/16 | 8.38 | N.Y. | | | | | |
| 1 3/4 | 9.02 | X | ... | X | 10.41 | X | X |
| 1 13/16 | 9.67 | N.Y. | N.Y. | .. | ... | ... | .. |
| 1 7/8 | 10.35 | X | ... | X | ... | ... | .. |
| 2 | 11.78 | X | ... | X | 13.60 | X | X |
| 2 1/2 | 18.40 | X | | | | | |

## STAINLESS BARS

**STAINLESS FLATS**
**Hot Rolled, Annealed and Pickled**

**TYPE 302** Identification Color: Yellow
**TYPE 304** Identification Color: Green
QQ-S-00763A, Class 304, Cond. A
**TYPE 316** Identification Color: Purple
DuPont SW 316M

Random Lengths: 14 to 16 Ft.

| Size in Inches | Est. Wt. per Ft. in Lbs. | 302 304 | 316 |
|---|---|---|---|
| 1/8 x 1/2 | .213 | X | |
| 3/4 | .319 | X | |
| 1 | .425 | X | X |
| 1 1/4 | .531 | X | |
| 1 1/2 | .638 | X | X |
| 2 | .850 | X | X |
| 2 1/2 | 1.06 | X | |
| 3 | 1.28 | X | |
| 3/16 x 1/2 | .319 | X | |
| 5/8 | .399 | X | |
| 3/4 | .478 | X | |
| 1 | .638 | X | X |
| 1 1/4 | .797 | X | |
| 1 1/2 | .957 | X | X |
| 2 | 1.28 | X | X |
| 2 1/2 | 1.59 | X | |
| 3 | 1.91 | X | |
| 1/4 x 1/2 | .425 | X | |
| 5/8 | .531 | X | |
| 3/4 | .636 | X | |
| 1 | .850 | X | X |
| 1 1/4 | 1.06 | X | |
| 1 1/2 | 1.28 | X | X |
| 1 3/4 | 1.49 | X | |
| 2 | 1.70 | X | X |
| 2 1/2 | 2.12 | X | |
| 3 | 2.55 | X | X |
| 4 | 3.40 | X | |
| 6 | 5.10 | St.L. | |
| 3/8 x 1/2 | .638 | X | |
| 3/4 | .957 | X | |
| 1 | 1.28 | X | X |
| 1 1/4 | 1.59 | X | |
| 1 1/2 | 1.92 | X | X |
| 1 3/4 | 2.23 | X | |
| 2 | 2.55 | X | X |
| 2 1/2 | 3.19 | X | X |
| 3 | 3.83 | X | X |
| 4 | 5.10 | X | |
| 5 | 6.38 | X | |
| 1/2 x 1 | 1.70 | X | X |
| 1 1/4 | 2.12 | X | |
| 1 1/2 | 2.55 | X | X |
| 1 3/4 | 2.98 | X | |

(Continued)

# STAINLESS BARS

## STAINLESS FLATS

**Hot Rolled, Annealed and Pickled**

| Size in Inches | Est. Wt. per Ft. in Lbs. | 302 304 | 316 |
|---|---|---|---|
| *(Continued)* | | | |
| ½x2 | 3.40 | X | X |
| 2½ | 4.25 | X | X |
| 3 | 5.10 | X | X |
| 4 | 6.80 | X | X |
| ⅝x1 | 2.12 | St.L. | |
| 1½ | 3.19 | St.L. | |
| 2 | 4.25 | X | |
| 2½ | 5.31 | X | |
| 3 | 6.38 | X | |
| 4 | 8.50 | X | |
| 6 | 12.75 | X | |
| ¾x1 | 2.55 | X | |
| 1½ | 3.83 | X | |
| 2 | 5.10 | X | X |
| 2½ | 6.38 | X | |
| 3 | 7.65 | X | X |
| 4 | 10.20 | X | |
| 5 | 12.75 | X | |
| 6 | 15.30 | X | |
| 1 x1½ | 5.10 | St.L. | |
| 1¾ | 5.95 | Phil. | |
| 2 | 6.80 | X | X |
| 2½ | 8.50 | Phil. | |
| 3 | 10.20 | X | X |
| 4 | 13.60 | X | |
| 6 | 20.40 | X | |

## STAINLESS ANGLES

**Hot Rolled, Annealed and Pickled**

**TYPE 304** Identification Color: Green
MIL-S-854, Class 1, Condition A

**TYPE 316** Identification Color: Purple

Random Lengths: 18 to 22 Ft.

| Size in Inches | Approx. Wt. per Ft. in Lbs. | 302 304 | 316* |
|---|---|---|---|
| ¾x ¾x⅛ | .59 | X | |
| 1 x1 x⅛ | .80 | X | X |
| 3/16 | 1.16 | X | X |
| 1¼x1¼x⅛ | 1.01 | X | X |
| 3/16 | 1.48 | X | X |
| 1½x1½x⅛ | 1.23 | X | X |
| 3/16 | 1.80 | X | X |
| ¼ | 2.34 | X | |
| 2 x2 x⅛ | 1.65 | X | |
| 3/16 | 2.44 | X | X |
| ¼ | 3.19 | X | X |
| 2½x2½x⅛ | 2.08 | Phil. | |
| 3/16 | 3.07 | X | |
| ¼ | 4.10 | X | |
| 3 x3 x¼ | 4.90 | X | X |
| 5/16 | 6.10 | X | |
| ⅜ | 7.20 | X | |

* In our St. Louis plant.

## STAINLESS PIPE

### COLD DRAWN, ANNEALED AND PICKLED

**TP 304** Identification Color: Green
ASTM A312-55T

**TP 304L** Identification Color: Gold
DuPont SW-820-M, Grade 820-F
General Electric (AEC) HWS-8064-S

**TP 316** Identification Color: Purple
ASTM A312-55T

**TP 316L** Identification Color: Purple & White
DuPont SW-820-M, Grade 820-G

Random Lengths: 17 to 24 Ft.

| Iron Pipe Size in Inches | Wt. per Ft. in Lbs. | Diameter in Inches O.D. | Diameter in Inches I.D. | Wall Thick., Inches | 304 | 304L | 316 | 316L |
|---|---|---|---|---|---|---|---|---|
| *Schedule 5*—Light Wall Iron Pipe Sizes—Welded | | | | | | | | |
| ¾ | .6838 | 1.050 | .920 | .065 | Phil. | | Phil. | |
| 1 | .8678 | 1.315 | 1.185 | .065 | Phil. | | Phil. | |
| 1¼ | 1.107 | 1.660 | 1.530 | .065 | Phil. | | Phil. | |
| 1½ | 1.274 | 1.900 | 1.770 | .065 | Cinc. | | Cinc. | |
| 2 | 1.604 | 2.375 | 2.245 | .065 | St. L. | | Cinc. | |
| 3 | 3.029 | 3.500 | 3.334 | .083 | St. L. | | Cinc. | |
| 3½ | 3.472 | 4.000 | 3.834 | .083 | St. L. | | Buff. | |
| 4 | 3.915 | 4.500 | 4.334 | .083 | St. L. | | Cinc. | |
| *Schedule 10*—Light Wall Iron Pipe Sizes—Welded | | | | | | | | |
| ¾ | .8572 | 1.050 | .884 | .083 | N.Y. | | N.Y. | |
| 1 | 1.404 | 1.315 | 1.097 | .109 | St. L. | Cinc. | St. L. | Cinc. |
| 1¼ | 1.806 | 1.660 | 1.442 | .109 | St. L. | | St. L. | |
| 1½ | 2.085 | 1.900 | 1.682 | .109 | St. L. | Cinc. | St. L. | Cinc. |
| 2 | 2.638 | 2.375 | 2.157 | .109 | St. L. | Cinc. | St. L. | Cinc. |
| 2½ | 3.531 | 2.875 | 2.635 | .120 | Pgh. | Cinc. | N.Y. | |
| 3 | 4.332 | 3.500 | 3.260 | .120 | St. L. | Cinc. | St. L. | Cinc. |
| 3½ | 4.973 | 4.000 | 3.760 | .120 | St. L. | | N.Y. | |
| 4 | 5.613 | 4.500 | 4.260 | .120 | St. L. | Pgh. | St. L. | Cinc. |
| *Schedule 40*—Standard Iron Pipe Sizes—Seamless and Welded | | | | | | | | |
| ⅛ | .2447 | .405 | .269 | .068 | Chgo. | | Chgo. | |
| ¼ | .4248 | .540 | .364 | .088 | Chgo. | Chgo.* | Chgo. | |
| ⅜ | .5676 | .675 | .493 | .091 | Chgo. | Chgo.* | Chgo. | |
| ½ | .8510 | .840 | .622 | .109 | Chgo. | Chgo.* | Chgo. | |
| ¾ | 1.131 | 1.050 | .824 | .113 | Chgo. | Chgo.* | Chgo. | |
| 1 | 1.679 | 1.315 | 1.049 | .133 | Chgo. | Chgo.* | Chgo. | St. L.* |
| 1¼ | 2.273 | 1.660 | 1.380 | .140 | Chgo. | Chgo.* | Chgo. | |
| 1½ | 2.718 | 1.900 | 1.610 | .145 | Chgo. | Chgo.* | Chgo. | St. L.* |
| 2 | 3.653 | 2.375 | 2.067 | .154 | Chgo. | Chgo.* | Chgo. | St. L.* |
| 2½ | 5.793 | 2.875 | 2.469 | .203 | Chgo.† | | Chgo.† | |
| 3 | 7.576 | 3.500 | 3.068 | .216 | Chgo.† | Chgo.† | Chgo.† | St. L.† |
| 3½ | 9.109 | 4.000 | 3.548 | .226 | Chgo.† | | | |
| 4 | 10.79 | 4.500 | 4.026 | .237 | Chgo.† | Chgo.† | Chgo.† | St. L.† |
| 5 | 14.62 | 5.563 | 5.047 | .258 | Chgo.† | | Bost.† | |
| 6 | 18.97 | 6.625 | 6.065 | .280 | Chgo.† | Chgo.† | Chgo.† | St. L.† |
| 8 | 28.55 | 8.625 | 7.981 | .322 | St. L.† | | St. L.† | |
| *Schedule 80*—Extra Heavy Iron Pipe Sizes—Seamless | | | | | | | | |
| ⅛ | .3145 | .405 | .215 | .095 | Phil. | | | |
| ¼ | .5351 | .540 | .302 | .119 | St. L. | | | |
| ⅜ | .7388 | .675 | .423 | .126 | Chgo. | | | |
| ½ | 1.088 | .840 | .546 | .147 | Chgo. | | | |
| ¾ | 1.474 | 1.050 | .742 | .154 | Chgo. | | | |
| 1 | 2.172 | 1.315 | .957 | .179 | Chgo. | | Pgh. | |
| 1¼ | 2.997 | 1.660 | 1.278 | .191 | Chgo. | | | |
| 1½ | 3.631 | 1.900 | 1.500 | .200 | Chgo. | | Pgh. | |
| 2 | 5.022 | 2.375 | 1.939 | .218 | Chgo. | | Pgh. | |
| 2½ | 7.661 | 2.875 | 2.323 | .276 | St. L. | | | |
| 3 | 10.25 | 3.500 | 2.900 | .300 | Chgo. | | Pgh. | |
| 3½ | 12.51 | 4.000 | 3.364 | .318 | St. L. | | | |
| 4 | 14.98 | 4.500 | 3.826 | .337 | Chgo. | | Pgh. | |
| 5 | 20.78 | 5.563 | 4.813 | .375 | St. L. | | | |
| 6 | 28.57 | 6.625 | 5.761 | .432 | St. L. | | Pgh. | |
| 8 | 43.49 | 8.625 | 7.625 | .500 | Phil. | | | |

*Welded only. †Seamless only.

## STAINLESS SCREWED TYPE PIPE FITTINGS

**Type 304 and Type 316**

We maintain complete stocks of Stainless Screwed Type Fittings in all standard iron pipe sizes (⅛", ¼", ⅜", ½", ¾", 1", 1¼", 1½", 2", 2½", 3").

- Couplings
- 45° Elbows
- 90° Elbows
- 90° Street Elbows
- Tees
- Unions
- Plugs
- Caps
- Crosses
- Bushings
- Locknuts
- Companion Flanges
- Close Nipples
- Short Nipples
- 2" Nipples
- 3" Nipples
- 4" Nipples
- 5" Nipples
- 6" Nipples

## STAINLESS WELDING PIPE FITTINGS

**Type 304—Type 304L—Type 316—Type 347**
**Schedule 40**

| Item | Iron Pipe Size, Inches | | | | | |
|---|---|---|---|---|---|---|
| 90° Elbows | 1* | 1½* | 2* | 2½ | 3* | 4* |
| 45° Elbows | 1* | 1½* | 2* | 2½ | 3* | 4* |
| Lap Joint Stub Ends | 1 | 1½ | 2 | 2½ | 3 | 4 |
| Caps | 1 | 1½ | 2 | 2½ | 3 | 4 |
| Short Stub Ends | 1* | 1½* | 2* | ... | 3* | 4* |

* Also carried in light weight—Schedule 10.

Note: Slip-on and blind flanges are available for use with the above welding fittings.

## COOPER STAINLESS VALVES

**Type 304 and Type 316**

*Other sizes and analyses and other types of valves and fittings are also available for prompt shipment*

| Iron Pipe Size (IPS) in Inches | | | | | |
|---|---|---|---|---|---|
| GATE VALVES | | | | | GLOBE VALVES |
| Fig. 100 | Fig. 101 | Fig. 115 | Fig. 117 | Fig. 3151 | Figure 35 |
| ... | ½ | ½ | ... | ½ | ½ |
| ... | ¾ | ¾ | ... | ¾ | ¾ |
| 1 | 1 | 1 | ... | 1 | 1 |
| 1½ | 1½ | ... | 1½ | ... | 1½ |
| 2 | 2 | ... | ... | ... | ... |
| 3 | ... | ... | ... | ... | ... |
| 4 | ... | ... | ... | ... | ... |

**Fig. 100**—Flanged ends; outside screw and yoke; bolted bonnet.
**Fig. 101**—Screw ends; outside screw and yoke; bolted bonnet.
**Fig. 115**—Screw ends; inside screw rising stem; union bonnet.
**Fig. 117**—Screw ends; inside screw rising stem; bolted bonnet.
**Fig. 3151**—Screw ends; inside screw non-rising stem; union bonnet.
**Fig. 35**—Screw ends; inside screw rising stem; union bonnet.

## STAINLESS TUBING

**COLD DRAWN, ANNEALED and PICKLED**

**TP 304** Identification Color: Green
**TP 316** Identification Color: Purple
*ASTM A269-55*

Random Lengths: 15 to 24 Ft. S = Seamless W = Welded

| Size O.D. | Avg. Wall Thick. B.W. Ga. or Inches | Avg. Wall Thick. Dec. Inches | Size I.D. | Wt. per Ft. in Lbs. | 304 | 316 |
|---|---|---|---|---|---|---|
| 1/8 | 22 | .028 | .069 | .0290 | W | |
| 3/16 | 22 | .028 | .131 | .0478 | W | |
| | 20 | .035 | .117 | .0572 | W | |
| 1/4 | 22 | .028 | .194 | .0664 | W | |
| | 20 | .035 | .180 | .0804 | S-W | |
| | 18 | .049 | .152 | .1052 | S-W | |
| | 16 | .065 | .120 | .1284 | S-W | |
| 5/16 | 20 | .035 | .242 | .1039 | Buff.W | |
| | 18 | .049 | .214 | .1382 | Buff.S-W | |
| | 16 | .065 | .182 | .1722 | Buff.S-W | |
| 3/8 | 22 | .028 | .319 | .1038 | W | |
| | 20 | .035 | .305 | .1271 | S-W | |
| | 18 | .049 | .277 | .1706 | S-W | |
| | 16 | .065 | .245 | .2152 | S-W | |
| .405 | * | .068 | .269 | .2447 | S-W | W |
| | | .095 | .215 | .3145 | S | |
| 7/16 | 18 | .049 | .340 | .2036 | Buff.W | |
| | 16 | .065 | .307 | .2589 | Phil.W | |
| 1/2 | 20 | .035 | .430 | .1738 | S-W | |
| | 18 | .049 | .402 | .2360 | S-W | Buff.W |
| | 16 | .065 | .370 | .3020 | S-W | Buff.W |
| | 14 | .083 | .334 | .3696 | S | |
| | 13 | .095 | .310 | .4109 | S | |
| | 11 | .120 | .260 | .4870 | Buff.S | |
| .540 | * | .088 | .364 | .4248 | S-W | W |
| | | .119 | .302 | .5351 | S | |
| 5/8 | 20 | .035 | .555 | .2205 | S-W | |
| | 18 | .049 | .527 | .3014 | S-W | Buff.W |
| | 16 | .065 | .495 | .3888 | S-W | Buff.W |
| | 14 | .083 | .459 | .4805 | N.Y.S | |
| | 13 | .095 | .435 | .5377 | Buff.S | |
| | 11 | .120 | .385 | .6472 | S | |
| .675 | * | .091 | .493 | .5676 | S-W | W |
| | | .126 | .423 | .7388 | S | |
| 3/4 | 20 | .035 | .680 | .2673 | S-W | |
| | 18 | .049 | .652 | .3668 | S-W | Buff.W |
| | 16 | .065 | .620 | .4755 | S-W | Buff.W |
| | 14 | .083 | .584 | .5913 | Phil.W | |
| | 13 | .095 | .560 | .6646 | S-W | |
| | 11 | .120 | .510 | .8074 | S-W | |
| .840 | *12 | .109 | .622 | .8510 | S-W | S-W |
| | | .147 | .546 | 1.088 | S | |
| 7/8 | 18 | .049 | .777 | .4323 | S-W | |
| | 16 | .065 | .745 | .5623 | S-W | |
| | 11 | .120 | .635 | .9676 | S-W | |
| 1 | 20 | .035 | .930 | .3607 | S-W | |
| | 18 | .049 | .902 | .4977 | S-W | Buff.W |
| | 16 | .065 | .870 | .6491 | S-W | Buff.W |
| | 14 | .083 | .834 | .8129 | S-W | Buff.W |
| | 13 | .095 | .810 | .9182 | Phil.S-W | |
| | 11 | .120 | .760 | 1.128 | S-W | |
| | 3/16 | .188 | .625 | 1.630 | S | |
| | 1/4 | .250 | .500 | 2.003 | S | |

*(Cont'd)*

* Iron pipe size to A.S.T.M. A-312-55T.

## STAINLESS TUBING, *Continued*

**COLD DRAWN, ANNEALED and PICKLED**

| Size O.D. | Avg. Wall Thick. B.W. Ga. or Inches | Avg. Wall Thick. Dec. Inches | Size I.D. | Wt. per Ft. in Lbs. | 304 | 316 |
|---|---|---|---|---|---|---|
| 1.050 | *16 | .065 | .920 | .6838 | W | W |
| | *14 | .083 | .884 | .8572 | W | W |
| | | .113 | .824 | 1.131 | S-W | S-W |
| | | .154 | .742 | 1.474 | S | ... |
| 1 1/8 | 16 | .065 | .995 | .7359 | Phil.W | ... |
| | 11 | .120 | .885 | 1.288 | N.Y.S | ... |
| 1 1/4 | 20 | .035 | 1.180 | .4542 | Phil.W | ... |
| | 18 | .049 | 1.152 | .6285 | S-W | ... |
| | 16 | .065 | 1.120 | .8226 | S-W | Buff.W |
| | 14 | .083 | 1.084 | 1.034 | S-W | ... |
| | 11 | .120 | 1.010 | 1.448 | S-W | ... |
| | 3/16 | .188 | .875 | 2.132 | S | ... |
| | 1/4 | .250 | .750 | 2.670 | S | ... |
| 1.315 | *16 | .065 | 1.185 | .8678 | W | W |
| | 12 | .109 | 1.097 | 1.404 | W | W |
| | | .133 | 1.049 | 1.679 | S-W | S-W |
| | | .179 | .957 | 2.172 | S | S |
| 1 3/8 | 16 | .065 | 1.245 | .9094 | W | ... |
| 1 1/2 | 20 | .035 | 1.430 | .5476 | W | ... |
| | 18 | .049 | 1.402 | .7593 | S-W | ... |
| | 16 | .065 | 1.370 | .9962 | S-W | Buff.W |
| | 14 | .083 | 1.334 | 1.256 | S-W | Buff.W |
| | 13 | .095 | 1.310 | 1.426 | Phil.W | ... |
| | 11 | .120 | 1.260 | 1.769 | S-W | ... |
| | 3/16 | .188 | 1.125 | 2.634 | S | Buff.S |
| | 1/4 | .250 | 1.000 | 3.338 | S | ... |
| 1.660 | *16 | .065 | 1.530 | 1.107 | W | W |
| | 12 | .109 | 1.442 | 1.806 | W | W |
| | | .140 | 1.380 | 2.273 | S-W | S-W |
| | | .191 | 1.278 | 2.997 | S | ... |
| 1 3/4 | 16 | .065 | 1.620 | 1.170 | S-W | ... |
| | 14 | .083 | 1.584 | 1.478 | W | ... |
| | 11 | .120 | 1.510 | 2.089 | S | ... |
| | 3/16 | .188 | 1.375 | 3.136 | S | ... |
| 1 7/8 | 13 | .095 | 1.685 | 1.806 | S | ... |
| 1.900 | *16 | .065 | 1.770 | 1.274 | W | W |
| | 12 | .109 | 1.682 | 2.085 | W | W |
| | | .145 | 1.610 | 2.718 | S-W | S-W |
| | | .200 | 1.500 | 3.631 | S | S |
| 2 | 18 | .049 | 1.902 | 1.021 | S-W | ... |
| | 16 | .065 | 1.870 | 1.343 | S-W | Buff.W |
| | 14 | .083 | 1.834 | 1.699 | S-W | Buff.W |
| | 13 | .095 | 1.810 | 1.933 | N.Y.S | ... |
| | 12 | .109 | 1.782 | 2.201 | Phil.S | ... |
| | 11 | .120 | 1.760 | 2.409 | S-W | Buff.W |
| | 3/16 | .188 | 1.625 | 3.638 | S | Buff.S |
| | 1/4 | .250 | 1.500 | 4.673 | S | ... |
| 2 1/4 | 16 | .065 | 2.120 | 1.517 | S-W | ... |
| | 13 | .095 | 2.060 | 2.186 | S | ... |
| | 11 | .120 | 2.010 | 2.730 | S | ... |
| | 3/16 | .188 | 1.875 | 4.140 | S | ... |
| | 1/4 | .250 | 1.750 | 5.340 | S | ... |
| 2 3/8 | * | .065 | 2.245 | 1.604 | W | W |
| | * | .109 | 2.157 | 2.638 | W | W |
| | * | .154 | 2.067 | 3.653 | S-W | S-W |
| | * | .218 | 1.939 | 5.022 | S | S |

(Continued)

* Iron pipe size to A.S.T.M. A-312-55T.

## STAINLESS TUBING, *Continued*
### COLD DRAWN, ANNEALED AND PICKLED

| Size O.D. | Avg. Wall Thick. B.W. Ga. or Inches | Avg. Wall Thick. Dec. Inches | Size I.D. | Wt. per Ft. in Lbs. | 304 | 316 |
|---|---|---|---|---|---|---|
| 2½ | 18 | .049 | 2.402 | 1.283 | S-W | ... |
| | 16 | .065 | 2.370 | 1.690 | S-W | Buff.W |
| | 14 | .083 | 2.334 | 2.143 | W | ... |
| | 11 | .120 | 2.260 | 3.050 | S-W | ... |
| | 3/16 | .188 | 2.125 | 4.642 | S | ... |
| | ¼ | .250 | 2.000 | 6.008 | S | ... |
| 2¾ | 16 | .065 | 2.620 | 1.864 | Phil.S-W | ... |
| | 11 | .120 | 2.510 | 3.371 | Phil.S-W | ... |
| 2⅞ | * | .120 | 2.635 | 3.531 | W | W |
| | * | .203 | 2.469 | 5.793 | S | S |
| | * | .276 | 2.323 | 7.661 | S | ... |
| 3 | 16 | .065 | 2.870 | 2.037 | S-W | Buff.W |
| | 14 | .083 | 2.834 | 2.586 | W | Buff.W |
| | 11 | .120 | 2.760 | 3.691 | Phil.S | ... |
| | 3/16 | .188 | 2.625 | 5.646 | S | Buff.S |
| | ¼ | .250 | 2.500 | 7.343 | S | Buff.S |
| 3¼ | 11 | .120 | 3.010 | 4.011 | S-W | ... |
| 3½ | 16 | .065 | 3.370 | 2.385 | S-W | ... |
| | * | .083 | 3.334 | 3.029 | W | W |
| | 11 | .120 | 3.260 | 4.332 | S | W |
| | * | .216 | 3.068 | 7.576 | S | S |
| | * | .300 | 2.900 | 10.25 | S | S |
| 3¾ | 11 | .120 | 3.510 | 4.652 | S | ... |
| 4 | 16 | .065 | 3.870 | 2.732 | W | ... |
| | 14 | .083 | 3.834 | 3.472 | W | ... |
| | 13 | .095 | 3.810 | 3.962 | S | ... |
| | 11 | .120 | 3.760 | 4.973 | S-W | W |
| | 3/16 | .188 | 3.625 | 7.654 | Phil.S | Buff.S |
| | ¼ | .250 | 3.500 | 10.01 | ... | Buff.S |
| | * | .226 | 3.548 | 9.109 | S | ... |
| | * | .318 | 3.364 | 12.51 | S | ... |
| 4½ | * | .083 | 4.334 | 3.915 | W | W |
| | * | .120 | 4.260 | 5.613 | W | W |
| | * | .237 | 4.026 | 10.79 | S | S |
| | * | .337 | 3.826 | 14.98 | S | S |
| 5 5/16 | *10 | .134 | 5.295 | 7.770 | W | ... |
| | | .258 | 5.047 | 14.62 | S | S |
| | *⅜ | .375 | 4.813 | 20.78 | S | ... |
| 6⅝ | *12 | .109 | 6.407 | 6.349 | W | W |
| | *10 | .134 | 6.357 | 9.289 | W | W |
| | | .280 | 6.065 | 18.97 | S | S |
| | | .432 | 5.761 | 28.57 | S | ... |
| 8⅝ | * | .322 | 7.981 | 28.55 | S | S |
| | *½ | .500 | 7.625 | 43.39 | S | ... |

*Iron pipe size to A.S.T.M. A-312-55T.

### ORNAMENTAL STAINLESS TUBING

**TYPE 302** Identification Color: Yellow

*Welded—Unpolished—Outside Bead Removed*

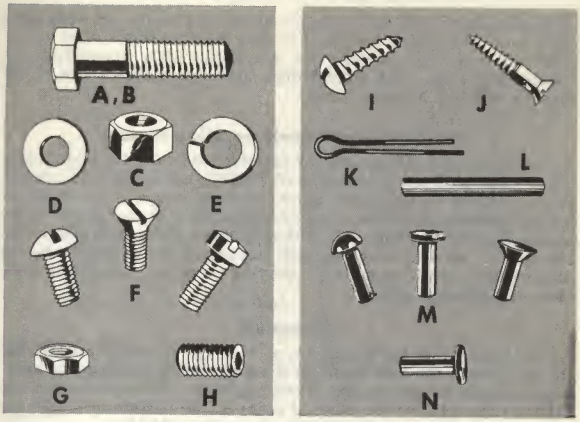
An excellent low cost stainless tubing for ornamental and structural uses. Outside weld bead removed by belt grinding which also removes much of the heat tint. Can be furnished polished.

Random Lengths: 15 to 22 Feet

| Size O.D. | Average Wall Thickness B.W. Ga. | Average Wall Thickness Dec. Inches | Size I.D. | Wt. per Ft. in Lbs. |
|---|---|---|---|---|
| ¾ | 18 | .049 | .652 | .3668 |
| 1 | 18 | .049 | .902 | .4977 |
| | 16 | .065 | .870 | .6491 |
| 1⅝ | 16 | .065 | 1.495 | 1.083 |

## STAINLESS FASTENINGS

**In our Buffalo Plant**




**Stainless Fastenings** described below are stocked in a full range of sizes ready for prompt shipment. Many additional stainless fastenings are regularly available from factory stock.

**A—Hexagon Head Cap Screws—Type 304**
Cold Headed, Annealed & Pickled—Class 2 Fit
1/4" to 3/8" diam.—20 to 16 threads/in.—1/2" to 3" lgth.

**B—Hexagon Head Bolts and Cap Screws—Types 304 & 316**
Hot Forged, Annealed & Pickled—Class 2 Fit
5/16" to 3/4" diam.—18 to 10 threads/in.—3/4" to 4" lgth.

**C—Hexagon Nuts—Type 303 & Type 316**
American Standard Regular or Heavy—Class 2 Fit
5/16" to 1" diam.—18 to 10 threads/in.

**D—Flat Punched Washers—Type 302**
No. 6, 8, 10 and 1/4, 5/16, 3/8, 1/2, 5/8, 3/4", 7/8" and 1" diam.

**E—"Kantlink" Lock Washers—Type 304**
No. 6, 8, 10 and 1/4, 5/16, 3/8, 1/2, 5/8 and 3/4" diam.

**F—Machine Screws—Type 304—Round, Flat & Fillister Head**
Cold Headed, Rolled Thread, Flat Point—Class 2 Fit
No. 6, 8, 10, 1/4, 5/16, 3/8" diam.—32 to 16 threads/in.—1/4" to 1 1/2" lgth.

**G—Hexagon Machine Screw Nuts—Type 304**
Milled from Bar—Class 2 Fit
No. 6, 8, 10 and 1/4" diam.—32, 24, 20 threads/in.

**H—Socket Head Set Screws—Type 303**—Cup Point—Class 2 Fit
1/4, 5/16, 3/8" diam.—20, 18, 16 threads/in.—1/4, 5/16, 3/8" lgth.

**I—Sheet Metal Screws—Type 304**—Round Head—"A" Point
No. 6, 8, 10 diam.—3/8, 1/2, 5/8" lgth.

**J—Wood Screws—Type 304**—Flat Countersunk Head
No. 6, 8, 10, 12, 14, 16 diam.—3/4, 1, 1 1/4, 1 1/2, 2" lgth.

**K—Cotter Pins—Type 304**
3/32, 1/16, 1/8, 3/16" diam.—1/2" to 2" lgth.

**L—Taper Pins—Type 303**—1/4" Taper per Foot
Sizes No. 610 to No. 4—1/2" to 2" lgth.

**M—Rivets—Type 304—Round, Flat & Countersunk Head**
Cold Headed, Annealed, Bright Finish
1/8, 3/16, 1/4" diam.—1/4" to 1 1/4" lgth.

**N—Tinners Rivets—Type 304**
Cold Headed, Annealed, Bright Finish
Sizes No. 1, 1 1/2, 2, 3, 4, 5 and 6

## The Aluminum Association Alloy Designation System

Wrought aluminum and wrought aluminum alloys are designated by a four digit index system. The first digit indicates alloy group. The last two digits identify the aluminum alloy or indicate the aluminum purity. The second digit indicates modifications of the original alloy or impurity limits.

### Aluminum and Aluminum Alloy Groups

In the four digit index system the first digit indicates the alloy group. Thus 1xxx indicates aluminum of 99.00% minimum and greater, 2xxx indicates an aluminum alloy in which copper is the major alloying element, and 3xxx an aluminum alloy with manganese as the major alloying element, etc. Although most aluminum alloys contain several alloying elements, only one group—6xxx for alloys with magnesium and silicon as major alloying elements—designates more than one alloying element.

### Aluminum

In the 1xxx group for aluminum of 99.00% minimum and greater the last two of the four digits in the designation indicate the minimum aluminum percentage. These digits are the same as the two digits to the right of the decimal point in the minimum aluminum percentage when it is expressed to the nearest 0.01%.

The second digit indicates modifications in impurity limits. If the second digit is zero, it indicates that there is no special control on individual impurities, while integers 1 through 9, which are assigned consecutively as needed, indicate special control of one or more individual impurities. Thus 1030 indicates 99.30% minimum aluminum without special control on individual impurities and 1130, 1230, 1330, etc. indicate the same purity with special control on one or more impurities. Likewise 1075, 1175, 1275, etc. indicate 99.75% minimum aluminum; and 1097, 1197, 1297, etc. 99.97%.

### Aluminum Alloys

In the 2xxx through 8xxx alloy groups the last two digits have no special significance but serve only to identify the different alloys in the group. Generally these digits are the same as those formerly used to designate the same alloy. Thus 2014 was formerly 14S, 3003 was 3S, and 7075 was 75S. For new alloys these last two digits are assigned consecutively beginning with xx01.

The second digit indicates alloy modifications. If the second digit is zero, it indicates the original alloy; while integers 1 through 9, which are assigned consecutively, indicate alloy modifications. In the former system letters were used to designate alloy modifications. These were assigned consecutively beginning with A. Thus 17S is now 2017 and A17S is 2117, 18S is 2018 and B18S is 2218.

### Experimental Alloys

Experimental alloys are also designated in accordance with this system but they are indicated by the prefix X.

### Temper Designations

The temper designation system in effect since December 31, 1947 is being continued without change. The temper designation follows the alloy designation and is separated from it by a dash. Thus 3S-O is now 3003-O, Alclad 24S-T81 is Alclad 2024-T81, and 75S-T6 7075-T6.

### Designations for Alloy Groups

| Assoc. Number | Major Alloying Element | Assoc. Number | Major Alloying Element |
|---|---|---|---|
| 1xxx | Aluminum (99.00% Min.) | 5xxx | Magnesium |
| 2xxx | Copper | 6xxx | Magnesium & Sil. |
| 3xxx | Manganese | 7xxx | Zinc |
| 4xxx | Silicon | 8xxx | Other Element |
| | | 9xxx | Unused |

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## ALUMINUM IN STOCK

Large and diversified stocks of Reynolds Aluminum are on hand in all commonly used types, forms and sizes. Aluminum specialists are always available on any problem you may have in the selection, fabrication or application of aluminum.

### A Guide to Modern Aluminum Alloys

Lightness and resistance to corrosion are probably the major reasons for the wide spread use of Aluminum throughout the modern world.

Weighing only ⅓ as much as steel, brass or nickel, its natural lightness and alloyed strength help load-conscious designers reduce weight on product after product.

Its natural finish is pleasing, durable and free from destructive rust. The surface may be mechanically finished and embossed in practically all ways as well as etched and electroplated. Anodizing may be used to increase corrosion resistance or produce irridescent finishes in brilliant colors. Aluminum may also be painted, enameled or lacquered.

Good formability, high electrical and thermal conductivity, superb reflectivity for light of all wave lengths and radiant heat, and non-magnetic, non-sparking qualities round out its many desirable physical properties.

Today's modern Aluminum alloys—including some with strength higher than structural steel—give you a choice of properties that suit an increasingly broad range of applications:

The non-heat-treatable alloys include 1100, 3003, 5005, 5050 and 5052 in various tempers, while the stronger, heat-treatable alloys include 6061, 2011, 2017, 2024, 2024 Alclad and 7075 Alclad. The alloys are listed in the order of increasing strength and decreasing workability. Cost varies in general with strength. 1100 and 3003 are the lowest priced, 2024 and 7075 the strongest and highest priced. 5005, 5050, 5052 and 6061 are in an intermediate position. 6063 is a special heat treatable alloy used for extrusions only.

### Aluminum Weights

The weights used throughout this section are based on 1100, 6061 and 6063 aluminum alloys. Other aluminum alloys weigh slightly less or slightly more.

The weights furnished in the pages that follow are accurate for all practical purposes. However, they are theoretical weights which may vary from the actual scale weights determined at time of sale.

For weights of alloys other than 1100, 6061 and 6063 you may want to use the conversion factors in the table below:

**Weight Conversion Factors for Aluminum Alloys**

| Alloy: | 1100 | 3003 | 5052 | 6061 | 6063 | 2011 | 2017 | 2024 | 7075 |
|---|---|---|---|---|---|---|---|---|---|
| Conversion Factor: | 1.00 | 1.01 | 0.98 | 1.00 | 1.00 | 1.04 | 1.03 | 1.02 | 1.03 |
| | *(.098)* | *(.099)* | *(.097)* | *(.098)* | *(.098)* | *(.102)* | *(.101)* | *(.100)* | *(.101)* |

Densities in Lbs./Cu. In. are indicated in parentheses.

## UTILITY ALUMINUM SHEET

Utility sheet is the lowest priced aluminum sheet and is particularly recommended for heating and ventilating ducts and general sheet metal work—taking a standard Pittsburgh lock seam without cracking. Designed for the sheet metal industry, it is not recommended for drawing or for applications that must meet flatness requirements.

| Dec. Thick. & Size, Inches (MS 33528) | Approx. Wt. per Sheet in Lbs. |
|---|---|
| **.063** (*.889 lbs. sq. ft.*) | |
| 36x 96 | 21.3 |
| 36x120 | 26.7 |
| 48x 96 | 28.4 |
| 48x120 | 35.6 |
| 48x144 | 42.7 |
| **.050** (*.706 lbs. sq. ft.*) | |
| 36x 96 | 16.9 |
| 36x120 | 21.2 |
| 48x 96 | 22.6 |
| 48x120 | 28.2 |
| 48x144 | 33.9 |
| **.040** (*.564 lbs. sq. ft.*) | |
| 36x 96 | 13.5 |
| 36x120 | 16.9 |
| 48x 96 | 18.0 |
| 48x120 | 22.6 |
| 48x144 | 27.1 |
| **.032** (*.452 lbs. sq. ft.*) | |
| 36x 96 | 10.8 |
| **.032** (*.452 lbs. sq. ft.*) | |
| 36x120 | 13.6 |
| 48x 96 | 14.5 |
| 48x120 | 18.1 |
| 48x144 | 21.7 |
| **.025** (*.353 lbs. sq. ft.*) | |
| 36x 96 | 8.5 |
| 36x120 | 10.6 |
| 48x 96 | 11.3 |
| 48x120 | 14.1 |
| 48x144 | 16.9 |
| **.020** (*.282 lbs. sq. ft.*) | |
| 36x 96 | 6.8 |
| 36x120 | 8.5 |
| **.018** (*.254 lbs. sq. ft.*) | |
| 36x 96 | 6.1 |
| 36x120 | 7.6 |
| **.016** (*.226 lbs. sq. ft.*) | |
| 36x 96 | 5.4 |
| 36x120 | 6.8 |

### Recommended Equivalent Galvanized and Aluminum Sheet Thicknesses for Duct Work

| Galvanized Sheets | | Aluminum Sheets |
|---|---|---|
| Galv. Sht. Gauge | Decimal Thickness | Decimal Thickness |
| **16 Ga.** | .0598″ | .063″ |
| **18 Ga.** | .0478″ | .050″ |
| **20 Ga.** | .0359″ | .040″ |
| **22 Ga.** | .0299″ | .032″ |
| **24 Ga.** | .0239″ | .025″ |
| **26 Ga.** | .0179″ | .020″ |
| **28 Ga.** | .0149″ | .016″ |

**Coiled Sheet** in all standard widths and most all types and tempers is a regular stock item. We will accurately cut flat sheets from these coils to any length up to 16 feet on quantity orders. Delivery is quick. Slitting requirements are handled with equal promptness. For more details on stocks and cutting facilities refer to pages 190 and 191.

## 1100 (2S) ALUMINUM SHEET

This is commercially pure aluminum (99.00% minimum)—noted for excellent resistance to corrosion, for easy workability including deep drawing, for weldability and high thermal conductivity. Used for deep drawing and spinning requirements, sheet metal work, decorative and architectural uses. Not heat treatable.

MILL FINISH

| Dec. Thickness and Size in Inches (MS 33528) | Approx. Weight in Lbs. Per Sq. Ft. | Per Sheet | 1100 O* Soft Temper | 1100 H14 Half Hard | 1100 H24† Half Hard |
|---|---|---|---|---|---|
| .190x36x 96 | 2.68 | 64.3 | | X | |
| 48x144 | " | 128.6 | | X | |
| .125x36x 96 | 1.76 | 42.2 | X | X | |
| 48x144 | " | 84.5 | X | X | |
| .100x36x 96 | 1.41 | 33.8 | X | X | |
| 48x144 | " | 67.7 | X | X | |
| .090x36x 96 | 1.27 | 30.5 | X | X | |
| 36x120 | " | 38.1 | X | X | |
| 48x 96 | " | 40.6 | X | X | |
| 48x120 | " | 50.8 | X | X | |
| 48x144 | " | 61.0 | X | X | |
| .080x36x 96 | 1.13 | 27.1 | X | X | |
| 36x120 | " | 33.9 | X | X | |
| 48x 96 | " | 36.2 | X | X | |
| 48x120 | " | 45.2 | X | X | |
| 48x144 | " | 54.2 | X | X | |
| .063x36x 96 | .889 | 21.3 | X | X | |
| 36x120 | " | 26.7 | X | X | |
| 48x 96 | " | 28.4 | X | X | |
| 48x120 | " | 35.6 | X | X | |
| 48x144 | " | 42.7 | X | X | |
| .050x36x 96 | .706 | 16.9 | X | X | |
| 36x120 | " | 21.2 | X | X | |
| 48x 96 | " | 22.6 | X | X | |
| 48x120 | " | 28.2 | X | X | |
| 48x144 | " | 33.9 | X | X | |
| .040x36x 96 | .564 | 13.5 | X | X | |
| 36x120 | " | 16.9 | X | X | |
| 48x 96 | " | 18.0 | X | X | |
| 48x120 | " | 22.6 | X | X | |
| 48x144 | " | 27.1 | X | X | |
| .032x36x 96 | .452 | 10.8 | X | X | X |
| 36x120 | " | 13.6 | X | X | |
| 48x 96 | " | 14.5 | X | X | |
| 48x120 | " | 18.1 | X | X | |
| 48x144 | " | 21.7 | X | X | |
| .025x36x 96 | .353 | 8.5 | X | X | X |
| 36x120 | " | 10.6 | X | X | |
| 36x144 | " | 12.7 | X | | |
| 48x 96 | " | 11.6 | X | X | |
| 48x120 | " | 14.1 | X | X | |
| 48x144 | " | 16.9 | X | X | |
| .020x36x 96 | .282 | 6.8 | X | X | X |
| 36x120 | " | 8.5 | X | X | |
| 36x144 | " | 10.2 | | X | |
| .016x36x 96 | .226 | 5.4 | | | X |

* Paper interleaved for protection. † One side bright—paper interleaved.

**Coiled Sheet** in all standard widths is a regular stock item. We will accurately cut flat sheets from these coils to any length up to 16 feet on quantity orders. Delivery is quick. Slitting requirements are handled with equal promptness.

## 3003 (3S) ALUMINUM SHEET

The addition of Manganese provides 20 to 25% increased strength compared with commercially pure aluminum. Resistance to corrosion is good. Workability, weldability and low cost are equivalent to 1100. Used for drawing, spinning, fuel tanks, sheet metal work when slightly higher strength than 1100 is required. Not heat treatable.

MILL FINISH

| Dec. Thickness and Size in Inches (MS 33528) | Approx. Weight in Lbs. Per Sq. Ft. | Per Sheet | 3003 O Soft Temper | 3003 H14 Half Hard |
|---|---|---|---|---|
| **.190**x36x 96 | 2.68 | 64.3 | | X |
| 48x144 | " | 128.6 | . . | X |
| **.125**x36x 96 | 1.76 | 42.2 | X | X |
| 36x120 | " | 52.8 | . . | X |
| 48x144 | " | 84.5 | X | X |
| 60x144 | " | 105.6 | . . | X |
| **.100**x36x 96 | 1.41 | 33.8 | X | X |
| 48x144 | " | 67.7 | X | X |
| **.090**x36x 96 | 1.27 | 30.5 | X | X |
| 36x120 | " | 38.1 | X | X |
| 48x 96 | " | 40.6 | X | X |
| 48x120 | " | 50.8 | X | X |
| 48x144 | " | 61.0 | X | X |
| **.080**x36x 96 | 1.13 | 27.1 | X | X |
| 36x120 | " | 33.9 | X | X |
| 48x 96 | " | 36.2 | X | X |
| 48x120 | " | 45.2 | X | X |
| 48x144 | " | 54.2 | X | X |
| **.063**x36x 96 | .889 | 21.3 | X | X |
| 36x120 | " | 26.7 | X | X |
| 48x 96 | " | 28.4 | X | X |
| 48x120 | " | 35.6 | X | X |
| 48x144 | " | 42.7 | X | X |
| 60x144 | " | 53.3 | . . | X |
| **.050**x36x 96 | .706 | 16.9 | X | X |
| 36x120 | " | 21.2 | X | X |
| 48x 96 | " | 22.6 | X | X |
| 48x120 | " | 28.2 | X | X |
| 48x144 | " | 33.9 | X | X |
| 60x144 | " | 42.4 | . . | X |
| **.040**x36x 96 | .564 | 13.5 | X | X |
| 36x120 | " | 16.9 | X | X |
| 48x 96 | " | 18.0 | X | X |
| 48x120 | " | 22.6 | X | X |
| 48x144 | " | 27.1 | X | X |
| 60x144 | " | 33.8 | . . | X |
| **.032**x36x 96 | .452 | 10.8 | X | X |
| 36x120 | " | 13.6 | X | X |
| 48x 96 | " | 14.5 | X | X |
| 48x120 | " | 18.1 | X | X |
| 48x144 | " | 21.7 | X | X |
| **.025**x36x 96 | .353 | 8.5 | X | X |
| 36x120 | " | 10.6 | X | X |
| 48x 96 | " | 11.3 | . . | X |
| 48x120 | " | 14.1 | . . | X |
| 48x144 | " | 16.9 | . . | X |
| **.020**x36x 96 | .282 | 6.8 | X | X |
| 36x120 | " | 8.5 | X | . . |

## 5005 (R305) ALUMINUM SHEET

This aluminum alloy has qualities comparable to 3003 and is particularly recommended for its anodizing qualities. In architectural applications it gives an excellent anodized match with 6063 extruded shapes.

MILL FINISH

| Dec. Thickness and Size in Inches (MS 33528) | Approx. Weight in Lbs. Per Sq. Ft. | Approx. Weight in Lbs. Per Sheet | 5005-H14 Half Hard |
|---|---|---|---|
| **.063**x36x 96 | .889 | 21.3 | X |
| 36x120 | " | 26.7 | X |
| **.050**x36x 96 | .706 | 16.9 | X |
| 36x120 | " | 21.2 | X |
| **.040**x36x 96 | .564 | 13.5 | X |
| 36x120 | " | 16.9 | X |
| **.032**x36x 96 | .452 | 10.8 | X |
| 36x120 | " | 13.6 | X |
| **.025**x36x 96 | .353 | 8.5 | X |
| 36x120 | " | 10.6 | X |

## 5050 (50S) ALUMINUM SHEET

This aluminum alloy has good workability, weldability and corrosion resistance. Strength is fair. Used for intermediate applications between 3003 and 5052.

MILL FINISH

| Dec. Thickness and Size in Inches (MS 33528) | Approx. Weight in Lbs. Per Sq. Ft. | Approx. Weight in Lbs. Per Sheet | 5050-H34 Half Hard |
|---|---|---|---|
| **.063**x48x 96 | .889 | 28.4 | X |
| 48x120 | " | 35.6 | X |
| 48x144 | " | 42.7 | X |
| **.050**x48x 96 | .706 | 22.6 | X |
| 48x120 | " | 28.2 | X |
| 48x144 | " | 33.9 | X |
| **.040**x48x 96 | .564 | 18.0 | X |
| 48x120 | " | 22.6 | X |
| 48x144 | " | 27.1 | X |
| **.032**x36x 96 | .452 | 10.8 | X |
| 36x120 | " | 13.6 | X |
| **.025**x36x 96 | .353 | 8.5 | X |
| 36x120 | " | 10.6 | X |

## EXPAND-X ALUMINUM

*3003-H 14 (3S-H 14)*

| Style Designation | Approx. Wt. per Sq. Ft. in Lbs. St'd. | Approx. Wt. per Sq. Ft. in Lbs. Flat | Approx. Wt. per Sheet in Lbs. 3'x8' St'd. | Approx. Wt. per Sheet in Lbs. 3'x8' Flat | Approx. Wt. per Sheet in Lbs. 4'x8' St'd. | Approx. Wt. per Sheet in Lbs. 4'x8' Flat |
|---|---|---|---|---|---|---|
| ½"...050 | .26 | .25 | 6.2 | 6.0 | 8.3 | 8.0 |
| .063 | .34 | .32 | .... | .... | 10.9 | 10.2 |
| .080 | .43 | .40 | 10.3 | 9.6 | 13.8 | 12.8 |
| ¾"...050 | .17 | .16 | 4.1 | 3.8 | 5.4 | 5.1 |
| .080 heavy | .40 | .38 | 9.6 | 9.1 | 12.8 | 12.2 |
| .080 light | .32 | .30 | 7.7 | 7.2 | 10.2 | 9.6 |
| .125 | .65 | .61 | 15.6 | 14.6 | 20.8 | 19.5 |
| 1½"...080 | .22 | .20 | 5.3 | 4.8 | 7.0 | 6.4 |
| .125 | .43 | .40 | 10.3 | 9.6 | 13.8 | 12.8 |

**Perforated Aluminum Sheet**—All types and patterns are regularly available on a prompt delivery basis.

## 5052 (52S) ALUMINUM SHEET

Alloyed with Magnesium and a small percentage of Chromium. Has about double the strength of commercially pure aluminum. An excellent general purpose alloy with good drawing characteristics, weldability and very good corrosion resistance. Used for aircraft fuel tanks, storm shutters, refrigerator liners, utensils, fan blades and other applications subject to abuse. Not heat treatable.

MILL FINISH

| Dec. Thickness and Size in Inches (MS 33528) | Approx. Weight in Lbs. Per Sq. Ft. | Per Sheet | 5052 O* Soft Temper | 5052 H32 Quarter Hard | 5052 H34 Half Hard |
|---|---|---|---|---|---|
| .190x36x 96 | 2.68 | 64.3 | | X | X |
| 48x144 | " | 128.6 | X | X | X |
| .125x36x 96 | 1.76 | 42.2 | | X | X |
| 48x144 | " | 84.5 | X | X | X |
| .100x36x 96 | 1.41 | 33.8 | | X | X |
| 48x144 | " | 67.7 | X | X | X |
| .090x36x 96 | 1.27 | 30.5 | X | X | X |
| 36x120 | " | 38.1 | X | X | X |
| 48x 96 | " | 40.6 | X | X | X |
| 48x120 | " | 50.8 | X | X | X |
| 48x144 | " | 61.0 | X | X | X |
| .080x36x 96 | 1.13 | 27.1 | X | X | X |
| 36x120 | " | 33.9 | X | X | X |
| 48x 96 | " | 36.2 | X | X | X |
| 48x120 | " | 45.2 | X | X | X |
| 48x144 | " | 54.2 | X | X | X |
| .063x36x 96 | .889 | 21.3 | X | X | X |
| 36x120 | " | 26.7 | X | X | X |
| 48x 96 | " | 28.4 | X | X | X |
| 48x120 | " | 35.6 | X | X | X |
| 48x144 | " | 42.7 | X | X | X |
| .050x36x 96 | .706 | 16.9 | X | X | X |
| 36x120 | " | 21.2 | X | X | X |
| 48x 96 | " | 22.6 | X | X | X |
| 48x120 | " | 28.2 | X | X | X |
| 48x144 | " | 33.9 | X | X | X |
| .040x36x 96 | .564 | 13.5 | X | X | X |
| 36x120 | " | 16.9 | X | X | X |
| 48x 96 | " | 18.0 | X | X | X |
| 48x120 | " | 22.6 | X | X | X |
| 48x144 | " | 27.1 | X | X | X |
| .032x36x 96 | .452 | 10.8 | X | X | X |
| 36x120 | " | 13.6 | X | X | X |
| 36x144 | " | 16.3 | X | .. | .. |
| 48x 96 | " | 14.5 | X | X | X |
| 48x120 | " | 18.1 | X | X | X |
| 48x144 | " | 21.7 | X | X | X |
| .025x36x 96 | .353 | 8.5 | X | X | X |
| 36x120 | " | 10.6 | X | X | X |
| 36x144 | " | 12.7 | .. | X | X |
| .020x36x 96 | .282 | 6.8 | X | X | X |
| 36x120 | " | 8.5 | X | X | X |
| 36x144 | " | 10.2 | | X | X |

* Paper interleaved for surface protection.

**Coiled Sheet** in all standard widths and most all types and tempers is a regular stock item. We will accurately cut flat sheets from these coils to any length up to 16 feet on quantity orders. Delivery is quick. Slitting needs are handled with equal promptness. For more details refer to page 190.

## 6061 (61S) ALUMINUM SHEET

The least expensive heat treatable alloy, this is a general purpose aluminum for structural uses—with strength about equal to ordinary low carbon steel. Workability is fair, corrosion resistance good. Weldable by all methods. Uses: vehicle and equipment construction, barrels, canoes, etc.

MILL FINISH

*Stenciled with alloy, gauge and temper*

| Dec. Thickness & Size, Inches (MS 33528) | Approx. Weight in Lbs. Per Sq. Ft. | Per Sheet | 6061-O* | 6061-T6 |
|---|---|---|---|---|
| .190x48x144 | 2.68 | 128.6 | | X |
| .125x48x144 | 1.76 | 84.5 | | X |
| .090x48x144 | 1.27 | 61.0 | | X |
| .080x48x144 | 1.13 | 54.2 | | X |
| .063x48x144 | .889 | 42.7 | X | X |
| .050x48x144 | .706 | 33.9 | X | X |
| .040x48x144 | .564 | 27.1 | X | X |
| .032x48x144 | .452 | 21.7 | X | X |

* Paper Interleaved for surface protection.

## 2024 (24S) ALUMINUM SHEET

With Copper as the principle alloying element, 2024 is one of the highest strength aluminum alloys. Used for high strength structural and aircraft applications. Forming operations are restricted to the annealed and recrystalized (0) condition followed by heat treatment. Welding by heliarc process only. For improved corrosion resistance the clad form is specified.

Stenciled and Interleaved

| Dec. Thickness and Size in Inches (MS 33528) | Approx. Weight in Lbs. Per Sq. Ft. | Per Sheet | 2024-T3 BARE | 2024-T3 ALCLAD |
|---|---|---|---|---|
| .190x48x144 | 2.68 | 128.6 | X | X |
| .125x48x144 | 1.76 | 84.5 | X | X |
| .090x48x144 | 1.27 | 61.0 | X | X |
| .080x48x144 | 1.13 | 54.2 | X | X |
| .063x48x144 | .889 | 42.7 | X | X |
| .050x48x144 | .706 | 33.9 | X | X |
| .040x48x144 | .564 | 27.1 | X | X |
| .032x48x144 | .452 | 21.7 | X | X |
| .025x48x144 | .353 | 16.9 | X | X |
| .020x36x144 | .282 | 10.2 | X | X |

## ALUMINUM PLATE Mill Finish

| Dec. Thickness and Size in Inches | Approx. Wt. Per Sq. Ft. | Approx. Wt. Per Plate | 1100 F | 3003 F | 5052 F | 6061 T6 | 2024 T4 |
|---|---|---|---|---|---|---|---|
| .250x36x 96 | | 3.53 | 84.7 | X | X | | |
| 48x144 | | " | 169.4 | X | X | X | X | X |
| .375x36x 96 | | 5.29 | 127.0 | X | X | | X | |
| 48x144 | | " | 253.9 | X | X | X | X | X |
| .500x36x 96 | | 7.06 | 169.4 | X | X | | X | X |
| 72x144 | | " | 508.3 | | X | | | |
| .625x36x 96 | | 8.82 | 211.7 | | | | X | X |
| .750x36x 96 | | 10.58 | 253.9 | X | X | | X | X |
| 72x144 | | " | 761.8 | | X | | | |
| *.875x36x 96 | | 12.35 | 296.4 | | | | X | X |
| *1.000x36x 96 | | 14.11 | 338.6 | | | | X | X |
| *1.250x36x 96 | | 17.64 | 423.4 | | | | X | X |
| *1.500x36x 96 | | 21.17 | 508.1 | | | | X | X |
| *1.750x36x 96 | | 24.70 | 592.8 | | | | | X |
| *2.000x36x 96 | | 28.22 | 677.3 | | | | X | X |

* 7/8" and heavier have sawed edges.

## DIAMOND TREAD ALUMINUM PLATE

**6061-T6 (61S-T6)**

*Raised pattern is on approximately 1" centers. Opposite side is smooth.*

| Dec. Thickness and Size in Inches | Approx. Weight Per Sq. Ft. | Approx. Weight Per Plate |
|---|---|---|
| .100x48x192 | 1.57 | 100.5 |
| .125x48x192 | 1.90 | 121.6 |
| .190x48x192 | 2.83 | 181.1 |
| .190x60x192 | 2.83 | 226.4 |
| .250x48x192 | 3.70 | 236.8 |
| 60x192 | " | 296.0 |

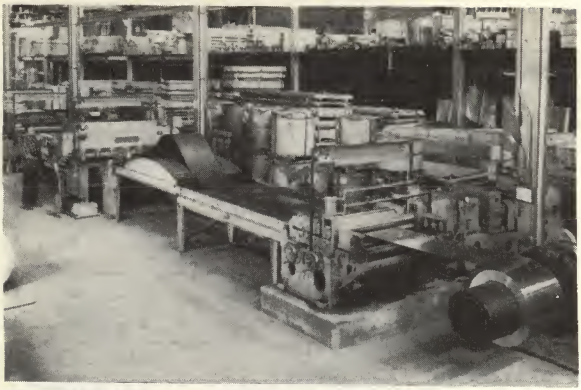
## CAST ALUMINUM TOOLING PLATE

**Pioneer Formula 921-T**

A versatile tooling material for all types of jigs, dies, fixtures, templates. Lightweight aluminum alloy reduces labor costs up to 60%. Cutting speeds up to 6000 FPM in turning, milling, drilling. 100% stable—no creeping or distortion. Easily welded. 28,000 psi average tensile strength (45,000 psi when heat treated, T6).

**Tolerances:** Thickness: plus or minus .010". Flatness: all areas within .010" on all plates 1" or over, using 8' straight edge. Length and Width: plus or minus 1/8". Finish: 32 micro-inch finish on two sides.

| Dec. Thickness and Size in Inches | Approx. Weight Per Sq. Ft. | Approx. Weight Per Plate |
|---|---|---|
| .375x48x96 | 5.29 | 169.3 |
| .500x48x96 | 7.06 | 225.9 |
| .625x48x96 | 8.82 | 282.2 |
| .750x48x96 | 10.58 | 338.6 |
| 1.000x48x96 | 14.11 | 451.5 |
| 1.250x48x96 | 17.64 | 564.5 |
| 1.500x48x96 | 21.17 | 677.4 |
| 1.750x48x96 | 24.69 | 790.1 |
| 2.000x48x96 | 28.22 | 903.0 |
| 2.500x48x96 | 35.28 | 1129.0 |
| 3.000x48x96 | 42.33 | 1354.6 |
| 3.500x48x96 | 49.39 | 1580.5 |
| 4.000x48x96 | 56.44 | 1806.1 |



Our 90 foot roller-leveler and cut-to-length line quickly converts coil stock into flat sheets to your special size requirement.

## Sheets Cut to Special Size
## Coils Slit to Intermediate Widths

● *Our modern Decoiling and Slitting Lines will save you money and serve you quickly.*

The size-flexibility and low-scrap factor inherent in coil stock continues to increase its popularity. Coils can be quickly and economically slit to any width you specify —or flat sheets may be produced from them in whatever special size you may require.

Our stock of aluminum coil includes utility quality sheet and types 1100, 3003, 5005, 5050 and 5052 in a wide choice of tempers.

We always look forward to giving you the best possible service on your every coil need.

Our 48″ slitter and its 24″ companion (not shown) can handle your slit-to-width needs quickly, accurately.

# ALUMINUM COILED SHEET

*Coils slit to any width • Sheets sheared to any length from coils*

## UTILITY COILED SHEET

Utility sheet is the lowest priced Aluminum sheet and is particularly recommended for duct work and general sheet metal work—taking a standard Pittsburgh lock seam without cracking. Designed for the sheet metal industry, it is not recommended for drawing or for applications that must meet flatness requirements.

| Dec. Thickness in Inches | Width in Inches | Approx. Wt. Sq. Ft. in Lbs. | Dec. Thickness in Inches | Width in Inches | Approx. Wt. Sq. Ft. in Lbs. |
|---|---|---|---|---|---|
| **.063** | 36,48 | .889 | **.025** | 36,48 | .353 |
| **.050** | 36,48 | .706 | **.020** | 36 | .282 |
| **.040** | 36,48 | .564 | **.018** | 24,36 | .254 |
| **.032** | 36,48 | .452 | | | |

## STANDARD COILED SHEETS—MILL FINISH

*Stock coils will approximate 70 to 100 lbs. per inch of coil width*

| Dec. Thickness in Inches | Approx. Wt. per Sq. Ft. in Lbs. | Width in Inches | | |
|---|---|---|---|---|
| | | **1100-O 1100-H14** | **3003-O** | **3003-H14** |
| **.125** | 1.76 | | | 36 |
| **.090** | 1.27 | 36 | 36,48 | 36,48 |
| **.080** | 1.13 | 36,48 | 36,48 | 36,48 |
| **.063** | .889 | 36,48 | 36,48 | 36,48 |
| **.050** | .706 | 36,48 | 36,48 | 36,48 |
| **.040** | .564 | 36,48 | 36,48 | 36,48 |
| **.032** | .452 | 36,48 | 36,48 | 36,48 |
| **.025** | .353 | 36 | 36 | 36,48 |
| **.020** | .282 | 24† | 36 | 36 |
| **.018** | .254 | | | 24 |

† 1100-H14 only.

| Decimal Thickness in Inches | Approx. Weight per Sq. Ft. in Lbs. | Width in Inches | | |
|---|---|---|---|---|
| | | **5005-H14** | **5050-H34** | **5052-O 5052-H32 5052-H34** |
| **.090** | 1.27 | | | 36,48 |
| **.080** | 1.13 | .. | .. | 36,48 |
| **.063** | .889 | 36 | 48 | 36,48 |
| **.050** | .706 | 36 | 48 | 36,48 |
| **.040** | .564 | 36 | 48 | 36,48 |
| **.032** | .452 | 36 | 36 | 36,48 |
| **.025** | .353 | 36 | 36 | 36 |
| **.020** | .282 | | | 18 |

## ALUMINUM BAR

**2011-T3 Screw Machine Stock** is the best machining of all aluminum bar stock. The fine chips break up readily, encourage higher feeds and less tool wear. Produces an excellent machined finish. Strength is good, formability average.
**2017-T4 Screw Machine Stock** is an aluminum alloy with machinability that approaches 2011-T3. It is particularly suitable for deep drilling operations. Formability and corrosion resistance are good. Strength is approximately the same as 2011-T3.
**2024-T4 Aluminum Bar** is stronger than either 2011-T3 or 2017-T4. It can be machined satisfactorily—in some cases at speeds that approximate the screw machine alloys when special care and methods are used.
**6061-T6 Aluminum Bar** has excellent corrosion resistance and good formability with strength and machinability somewhat less than for the 2xxx (copper type) aluminum alloys.

### ALUMINUM ROUNDS

**2011-T3 *(11S-T3)*** **2024-4 *(24S-T4)***
**2017-T4 *(17S-T4)*** **6061-6 *(61S-T6)***

⅛ thru 5⁄16", Cold Drawn. ⅜ thru 2", Cold Finished. Over 2", Rolled

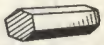
| Size in Inches | Approx. Wt. per Ft. in Lbs. | Stock Lengths in Feet | | | |
|---|---|---|---|---|---|
| | | 2011 | 2017 | 2024 | 6061 |
| ⅛ | .015 | 12 | 12 | 12 | .. |
| 5⁄32 | .023 | 12 | 12 | .. | .. |
| 3⁄16 | .032 | 12 | 12 | 12 | .. |
| 7⁄32 | .044 | 12 | 12 | .. | .. |
| ¼ | .058 | 12 | 12 | 12 | 12 |
| 9⁄32 | .073 | 12 | .. | .. | .. |
| 5⁄16 | .090 | 12 | 12 | 12 | 12 |
| 11⁄32 | .109 | 12 | .. | .. | .. |
| ⅜ | .130 | 12 | 12 | 12 | 12 |
| 13⁄32 | .152 | 12 | 12 | .. | .. |
| 7⁄16 | .177 | 12 | 12 | 12 | .. |
| 15⁄32 | .203 | 12 | .. | .. | .. |
| ½ | .231 | 12 | 12 | 12 | 12 |
| 17⁄32 | .260 | 12 | .. | .. | .. |
| 9⁄16 | .292 | 12 | 12 | 12 | 12 |
| ⅝ | .360 | 12 | 12 | 12 | 12 |
| 11⁄16 | .436 | 12 | 12 | 12 | .. |
| ¾ | .519 | 12 | 12 | 12 | 12 |
| 13⁄16 | .609 | 12 | 12 | .. | .. |
| ⅞ | .706 | 12 | 12 | 12 | 12 |
| 15⁄16 | .811 | 12 | 12 | .. | .. |
| 1 | .923 | 12 | 12 | 12 | 12 |
| 1 1⁄16 | 1.04 | 12 | 12 | .. | .. |
| 1 1⁄8 | 1.17 | 12 | 12 | 12 | .. |
| 1 3⁄16 | 1.30 | 12 | 12 | .. | .. |
| 1 ¼ | 1.44 | 12 | 12 | 12 | 12 |
| 1 5⁄16 | 1.59 | 12 | 12 | 12 | .. |
| 1 ⅜ | 1.74 | 12 | 12 | 12 | 12 |
| 1 7⁄16 | 1.91 | 12 | 12 | .. | .. |
| 1 ½ | 2.08 | 12 | 12 | 12 | 12 |
| 1 9⁄16 | 2.25 | 12 | 12 | .. | .. |
| 1 ⅝ | 2.44 | 12 | 12 | 12 | 12 |
| 1 11⁄16 | 2.63 | .. | 12 | .. | .. |
| 1 ¾ | 2.83 | 12 | 12 | 12 | 12 |

*(Continued)*

## ALUMINUM ROUNDS

| Size in Inches | Approx. Wt. Per Ft. in Lbs. | Stock Lengths in Feet 2011 | 2017 | 2024 | 6061 |
|---|---|---|---|---|---|
| *(Continued)* | | | | | |
| 1 13/16 | 3.03 | | 12 | | |
| 1 7/8 | 3.24 | 12 | 12 | 12 | .. |
| 1 15/16 | 3.46 | .. | 12 | .. | .. |
| 2 | 3.69 | 12 | 12 | 12 | 12 |
| 2 1/16 | 3.92 | .. | 12 | .. | .. |
| 2 1/8 | 4.17 | 12 | 12 | 12 | .. |
| 2 3/16 | 4.42 | .. | 12 | .. | .. |
| 2 1/4 | 4.67 | 12 | 12 | 12 | .. |
| 2 5/16 | 4.93 | .. | 12 | .. | .. |
| 2 3/8 | 5.20 | 12 | 12 | 12 | .. |
| 2 7/16 | 5.48 | .. | 12 | .. | .. |
| 2 1/2 | 5.77 | 12 | 12 | 12 | 12 |
| 2 5/8 | 6.36 | .. | 12 | 12 | .. |
| 2 3/4 | 6.98 | .. | 12 | 12 | .. |
| 2 7/8 | 7.63 | .. | 3-14 | .. | .. |
| 3 | 8.30 | .. | 3-14 | 6-14 | R/L |
| 3 1/8 | 9.01 | .. | 3-14 | 6-14 | .. |
| 3 1/4 | 9.75 | .. | 3-14 | 6-14 | .. |
| 3 3/8 | 10.51 | .. | 3-14 | 6-14 | .. |
| 3 1/2 | 11.30 | .. | 3-14 | 3-14 | .. |
| 3 3/4 | 12.97 | .. | 3-14 | 3-14 | .. |
| 4 | 14.76 | .. | 3-14 | 3-14 | R/L |
| 4 1/4 | 16.66 | .. | .. | .. | .. |
| 5 | 23.06 | .. | 3-14 | .. | .. |
| 5 1/2 | 27.99 | .. | 3-14 | .. | .. |
| 6 | 33.21 | .. | 3-14 | .. | .. |

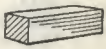
## ALUMINUM HEXAGONS



**2011-T3 *(11S-T3)* • 2017-T4 *(17S-T4)* • 2024-T4 *(24S-T4)***

| Size in Inches | Approx. Wt. Per Ft., Lbs. | Stock Lengths, Feet 2011 | 2017 | 2024 | Size in Inches | Approx. Wt. Per Ft., Lbs. | Stock Lengths, Feet 2011 | 2017 | 2024 |
|---|---|---|---|---|---|---|---|---|---|
| 3/8 | .143 | 12 | 12 | 12 | 1 | 1.11 | 12 | 12 | 12 |
| 7/16 | .195 | 12 | 12 | .. | 1 1/16 | 1.15 | .. | 12 | .. |
| 1/2 | .254 | 12 | 12 | 12 | 1 1/8 | 1.29 | 12 | 12 | 12 |
| 9/16 | .322 | 12 | 12 | .. | 1 3/16 | 1.43 | .. | 12 | .. |
| 5/8 | .397 | 12 | 12 | 12 | 1 1/4 | 1.59 | 12 | 12 | 12 |
| 11/16 | .481 | 12 | 12 | 12 | 1 5/16 | 1.75 | .. | 12 | .. |
| 3/4 | .572 | 12 | 12 | 12 | 1 3/8 | 1.92 | 12 | 12 | 12 |
| 13/16 | .672 | 12 | 12 | .. | 1 7/16 | 2.10 | .. | 12 | .. |
| 7/8 | .779 | 12 | 12 | 12 | 1 1/2 | 2.29 | .. | 12 | 12 |
| 15/16 | .893 | 12 | 12 | .. | 1 5/8 | 2.69 | .. | 12 | .. |

## ALUMINUM SQUARES 2024-T4 *(24S-T4)*



| Size in Inches | Approx., Wt. Per Ft. in Lbs. | Stock Lgths., Ft. | Size in Inches | Approx., Wt. Per Ft. in Lbs. | Stock Lgths., Ft. |
|---|---|---|---|---|---|
| 3/8 | .165 | 12 | 7/8 | .899 | 12 |
| 1/2 | .294 | 12 | 1 | 1.17 | 12 |
| 9/16 | .372 | 12 | 1 1/8 | 1.49 | 12 |
| 5/8 | .459 | 12 | 1 1/4 | 1.84 | 12 |
| 3/4 | .661 | 12 | 1 1/2 | 2.64 | 12 |

## ALUMINUM RECTANGULAR BARS

**2024-T4 (24S-T4) 6061-T6 (61S-T6) 6063-T5 (63S-T5)**

| Size in Inches | Approx. Wt. Per Ft. in Lbs. | Stock Lengths in Feet | | |
|---|---|---|---|---|
| | | 2024 | 6061 | 6063 |
| 1/8 x 1/2 | .073 | .. | .. | 16 |
| 1/8 x 5/8 | .092 | .. | .. | 16 |
| 1/8 x 3/4 | .110 | .. | .. | 16 |
| 1/8 x 1 | .147 | .. | .. | 16 |
| 1/8 x 1 1/4 | .184 | .. | .. | 16 |
| 1/8 x 1 1/2 | .220 | .. | .. | 16 |
| 1/8 x 1 3/4 | .257 | .. | .. | 16 |
| 1/8 x 2 | .294 | .. | .. | 16 |
| 3/16 x 1/2 | .110 | .. | .. | 16 |
| 3/16 x 3/4 | .165 | .. | .. | 16 |
| 3/16 x 1 | .220 | .. | .. | 16 |
| 3/16 x 1 1/4 | .275 | .. | .. | 16 |
| 3/16 x 1 1/2 | .330 | .. | .. | 16 |
| 3/16 x 2 | .441 | .. | .. | 16 |
| 3/16 x 2 1/2 | .551 | .. | .. | 16 |
| 1/4 x 1/2 | .147 | .. | .. | 16 |
| 1/4 x 5/8 | .184 | .. | .. | 16 |
| 1/4 x 3/4 | .220 | 12 | 12 | 16 |
| 1/4 x 1 | .294 | 12 | 12 | 16 |
| 1/4 x 1 1/4 | .367 | 12 | 12 | 16 |
| 1/4 x 1 1/2 | .441 | 12 | 12 | 16 |
| 1/4 x 1 3/4 | .514 | .. | .. | 16 |
| 1/4 x 2 | .587 | 12 | 12 | 16 |
| 1/4 x 2 1/2 | .734 | .. | .. | 16 |
| 1/4 x 3 | .881 | .. | .. | 16 |
| 5/16 x 3/4 | .275 | 12 | 12 | .. |
| 5/16 x 1 | .367 | 12 | 12 | .. |
| 5/16 x 1 1/4 | .459 | 12 | 12 | .. |
| 5/16 x 1 1/2 | .551 | 12 | 12 | .. |
| 5/16 x 2 | .734 | 12 | 12 | .. |
| 3/8 x 1/2 | .220 | .. | .. | 16 |
| 3/8 x 5/8 | .275 | .. | .. | 16 |
| 3/8 x 3/4 | .330 | 12 | 12 | 16 |
| 3/8 x 1 | .441 | 12 | 12 | 16 |
| 3/8 x 1 1/4 | .551 | 12 | 12 | 16 |
| 3/8 x 1 1/2 | .661 | 12 | 12 | 16 |
| 3/8 x 2 | .881 | 12 | 12 | 16 |
| 3/8 x 3 | 1.321 | .. | .. | 16 |
| 1/2 x 3/4 | .441 | 12 | 12 | 16 |
| 1/2 x 1 | .587 | 12 | 12 | 16 |
| 1/2 x 1 1/4 | .734 | 12 | 12 | 16 |
| 1/2 x 1 1/2 | .881 | 12 | 12 | 16 |
| 1/2 x 2 | 1.174 | 12 | 12 | 16 |
| 1/2 x 2 1/2 | 1.468 | .. | .. | 16 |
| 1/2 x 3 | 1.762 | .. | .. | 16 |
| 5/8 x 1 | .734 | 12 | 12 | .. |
| 5/8 x 1 1/4 | .918 | 12 | 12 | .. |
| 5/8 x 1 1/2 | 1.101 | 12 | 12 | .. |
| 5/8 x 2 | 1.468 | 12 | 12 | .. |
| 3/4 x 1 | .881 | 12 | 12 | .. |
| 3/4 x 1 1/4 | 1.101 | 12 | .. | .. |
| 3/4 x 1 1/2 | 1.321 | 12 | 12 | 16 |
| 3/4 x 2 | 1.702 | 12 | 12 | 16 |
| 1 x 1 1/4 | 1.468 | 12 | 12 | .. |
| 1 x 1 1/2 | 1.762 | 12 | 12 | 16 |
| 1 x 2 | 2.349 | 12 | 12 | 16 |
| 1 x 3 | 3.524 | 12 | 12 | 16 |

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## Typical Mechanical Properties of Aluminum Alloys

| Alloy & Temper | Strength, PSI | | % Elong. in 2" | | Shearing Strength, psi | Endurance Limit, psi | Brinell Hardness* |
|---|---|---|---|---|---|---|---|
| | Ultimate | Yield | 1/16" Sht. | 1/2" Rd. | | | |
| 1100-O | 13,000 | 5,000 | 35 | 45 | 9,500 | 5,000 | 23 |
| 1100-H12 | 16,000 | 14,000 | 12 | 25 | 10,000 | 6,000 | 28 |
| 1100-H14 | 18,000 | 16,000 | 9 | 20 | 11,000 | 7,000 | 32 |
| 1100-H16 | 21,000 | 19,000 | 6 | 17 | 12,000 | 8,500 | 38 |
| 1100-H18 | 24,000 | 22,000 | 5 | 15 | 13,000 | 8,500 | 44 |
| 3003-O | 16,000 | 6,000 | 30 | 40 | 11,000 | 7,000 | 28 |
| 3003-H12 | 19,000 | 17,000 | 10 | 20 | 12,000 | 8,000 | 35 |
| 3003-H14 | 22,000 | 20,000 | 8 | 16 | 14,000 | 9,000 | 40 |
| 3003-H16 | 26,000 | 24,000 | 5 | 14 | 15,000 | 9,500 | 47 |
| 3003-H18 | 29,000 | 27,000 | 4 | 10 | 16,000 | 10,000 | 55 |
| 2011-T3 | 55,000 | 48,000 | .. | 15 | 32,000 | 18,000 | 95 |
| 2017-O | 26,000 | 10,000 | .. | 22 | 18,000 | 13,000 | 45 |
| 2017-T4 | 62,000 | 40,000 | .. | 22 | 38,000 | 18,000 | 105 |
| 2117-T4 | 43,000 | 24,000 | .. | 27 | 28,000 | 13,500 | 70 |
| 2024-O | 27,000 | 11,000 | 19 | 22 | 18,000 | 13,000 | 47 |
| 2024-T3 | 70,000 | 50,000 | 16 | .. | 41,000 | 20,000 | 120 |
| 2024-T4 | 68,000 | 48,000 | 20 | 19 | 41,000 | 20,000 | 120 |
| 2024-T36 | 73,000 | 57,000 | 13 | .. | 42,000 | 18,000 | 130 |
| Alclad 2024-O | 26,000 | 11,000 | 20 | .. | 18,000 | ..... | ... |
| Alclad 2024-T3 | 64,000 | 44,000 | 18 | .. | 40,000 | ..... | ... |
| Alclad 2024-T36 | 67,000 | 53,000 | 11 | .. | 41,000 | ..... | ... |
| 5005-O | 18,000 | 6,000 | 30 | .. | 11,000 | ..... | 28 |
| 5005-H12 | 20,000 | 19,000 | 10 | .. | 14,000 | ..... | ... |
| 5005-H14 | 23,000 | 22,000 | 6 | .. | 14,000 | ..... | ... |
| 5005-H16 | 26,000 | 25,000 | 5 | .. | 15,000 | ..... | ... |
| 5005-H18 | 29,000 | 28,000 | 4 | .. | 16,000 | ..... | ... |
| 5050-O | 20,000 | 8,000 | 28 | .. | 15,000 | 12,000 | 35 |
| 5050-H32 | 24,500 | 20,500 | 10 | .. | 17,000 | 13,000 | 45 |
| 5050-H34 | 27,500 | 24,000 | 9 | .. | 18,000 | 13,000 | 50 |
| 5050-H36 | 29,000 | 26,000 | 8 | .. | 19,000 | 14,000 | 55 |
| 5050-H38 | 31,500 | 29,000 | 7 | .. | 20,000 | 14,000 | 68 |
| 5052-O | 28,000 | 13,000 | 25 | 30 | 18,000 | 17,000 | 45 |
| 5052-H32 | 34,000 | 27,000 | 11 | 18 | 20,000 | 17,000 | 62 |
| 5052-H34 | 37,000 | 31,000 | 9 | 14 | 21,000 | 18,000 | 67 |
| 5052-H36 | 39,000 | 34,000 | 8 | 10 | 23,000 | 18,500 | 74 |
| 5052-H38 | 41,000 | 36,000 | 7 | 8 | 24,000 | 19,000 | 85 |
| 6061-O | 18,000 | 8,000 | 22 | 30 | 12,500 | 9,000 | 30 |
| 6061-T4 | 35,000 | 21,000 | 22 | 25 | 24,000 | 13,500 | 65 |
| 6061-T6 | 45,000 | 41,000 | 12 | 17 | 30,000 | 13,500 | 95 |
| 6063-T42 | 22,000 | 13,000 | 20 | .. | 14,000 | ..... | 42 |
| 6063-T5 | 31,000 | 24,000 | 13 | .. | 18,000 | ..... | 65 |
| 6063-T6 | 35,000 | 30,000 | 12 | .. | 22,000 | ..... | 73 |
| Alclad 7075-O | 32,000 | 14,000 | 17 | .. | 22,000 | ..... | .. |
| Alclad 7075-T6 | 76,000 | 67,000 | 11 | .. | 46,000 | ..... | .. |

* 500 KG Load, 10 Mm. ball.

## Nominal Chemical Compositions Aluminum Alloys

| Alloy Desig. New | Alloy Desig. Old | Si | Cu | Mn | Mg | Cr | Zn | Pb | Bi |
|---|---|---|---|---|---|---|---|---|---|
| *1100 | 2S | | | | | | | | |
| 3003 | 3S | .... | ... | 1.2 | ... | .... | ... | .... | .... |
| 2011 | 11S | .... | 5.5 | ... | ... | .... | ... | 0.50 | 0.50 |
| 2017 | 17S | | 4.0 | 0.5 | 0.5 | | | | |
| 2117 | A17S | .... | 2.5 | ... | 0.3 | .... | ... | .... | .... |
| 2024 | 24S | .... | 4.5 | 0.6 | 1.5 | .... | ... | .... | .... |
| 5005 | R305 | 0.4 | 0.2 | 0.2 | 0.8 | 0.1 | .25 | .... | .... |
| 5050 | 50S | 0.4 | 0.2 | 0.1 | 1.4 | 0.1 | .25 | .... | .... |
| 5052 | 52S | .... | ... | ... | 2.5 | 0.25 | ... | .... | .... |
| 6061 | 61S | 0.6 | 0.25 | ... | 1.0 | 0.25 | ... | .... | .... |
| 6063 | 63S | 0.4 | ... | ... | 0.7 | .... | ... | .... | .... |
| 7075 | 75S | 0.5 | 1.6 | 0.3 | 2.5 | 0.29 | 5.6 | (0.2Ti) | |

* 99% minimum pure aluminum.
Values are in %. Aluminum and normal impurities constitute remainder.

## Fabricating Characteristics Aluminum Alloys

| Alloy & Temper | Cold Workability | Weldability Gas | Weldability Arc | Weldability Resist. | Braz-ability | Machin-ability |
|---|---|---|---|---|---|---|
| 1100-O | A+ | A | A | B | A | B |
| 1100-H18 | B− | A | A | B | A | B |
| 3003-O | A+ | A | A | B | A | B |
| 3003-H18 | C+ | A | A | B | A | B |
| 2011-T3 | C | D | C | D | X | A |
| 2017-O | A | D | D | C | X | B |
| 2017-T4 | C | D | D | C | X | A |
| 2117-T4 | B− | D | D | C | X | A |
| 2024-O | A | D | D | C | X | B |
| 2024-T3 | C− | D | D | B | X | A |
| 2024-T36 | D+ | D | D | B | X | A |
| Alclad 2024-T3 | C | D | D | A | X | A |
| Alclad 2024-T36 | C− | D | D | A | X | A |
| 5052-O | A+ | B | A | A | B | B |
| 5052-H38 | C+ | B | A | A | B | B |
| 6061-O | A | A | A | A | A | B |
| 6061-T4 | B | A | A | A | A | B |
| 6061-T6 | B− | A | A | A | A | B |
| 6063-T5 | B− | A | A | A | A | B |
| 6063-T6 | C+ | A | A | A | A | B |
| 7075-O | A | D | C | C | X | B |
| 7075-T6 | D | D | C | B | X | A |

**Relative Fabrication Rating:** **A** = Excellent, **B** = Good, **C** = Fair, **D** = Poor, and **X** = Cannot be brazed. Ratings are based on aluminum alloys as a group.

## 90° Cold Bending of Aluminum Sheet

**(Minimum Recommended Radii in 32nds of an Inch)**

| Alloy and Temper | Thickness of Sheet in Inches | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | .016 | .025 | .032 | .040 | .051 | .064 | .091 | .125 | .187 | .250 |
| 1100—O | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| H12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 6 |
| H14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 6 |
| H16 | 0 | 0 | 0 | 0 | 1 | 2 | 3 | 4 | 8 | 16 |
| H18 | 1 | 1 | 2 | 2 | 3 | 4 | 6 | 8 | 16 | 32 |
| 3003—O | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| H12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 6 |
| H14 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 4 | 8 |
| H16 | 0 | 0 | 1 | 2 | 2 | 3 | 5 | 6 | 12 | 24 |
| H18 | 1 | 2 | 3 | 4 | 5 | 6 | 9 | 12 | 24 | 40 |
| 5050—O | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| H32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 6 |
| H34 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 4 | 8 |
| H36 | 0 | 1 | 1 | 2 | 2 | 3 | 5 | 6 | 12 | 24 |
| H38 | 1 | 2 | 3 | 4 | 5 | 6 | 9 | 12 | 24 | 40 |
| 5052—O | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| H32 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 6 | 12 |
| H34 | 0 | 0 | 0 | 1 | 1 | 2 | 3 | 4 | 8 | 16 |
| H36 | 1 | 2 | 2 | 2 | 3 | 4 | 6 | 8 | 16 | 32 |
| H38 | 1 | 2 | 3 | 4 | 5 | 6 | 9 | 12 | 24 | 40 |
| *2024—O | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 |
| T3 | 1 | 3 | 4 | 5 | 7 | 8 | 12 | 16 | 32 | 48 |
| 6061—O | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 |
| T4 | 1 | 2 | 2 | 2 | 3 | 4 | 6 | 8 | 16 | 32 |
| T6 | 1 | 2 | 2 | 2 | 3 | 4 | 6 | 8 | 16 | 32 |
| *7075—O | 0 | 0 | 0 | 1 | 1 | 1 | 3 | 4 | 8 | 16 |
| T6 | 2 | 4 | 6 | 8 | 10 | 12 | 18 | 24 | 40 | 64 |

* Bend Radii apply also to Alclad 2024 and 7075.

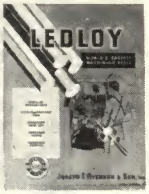
## Aluminum Association Alloy Designations

| Old Commercial Designation | New Aluminum Association Designation |
|---|---|
| EC | EC |
| 99.3 (1) | 1230 |
| 99.75 (2) | 1175 |
| 2S | 1100 |
| 3S | 3003 |
| Alclad 3S | Alclad 3003 |
| 4S | 3004 |
| Alclad 4S | Alclad 3004 |
| 11S | 2011 |
| 14S | 2014 |
| 17S | 2017 |
| A17S | 2117 |
| 18S | 2018 |
| B18S | 2218 |
| 24S | 2024 |
| Alclad 24S | Alclad 2024 |
| 25S | 2025 |
| 32S | 4032 |
| 43S | 4043 |
| 44S | 4343 |
| 50S | 5050 |
| A51S | 6151 |
| J51S | 6951 |
| 52S | 5052 |
| X55S | X5055 |
| Alclad X55S | Alclad X5055 |
| 56S | 5056 |
| C57S | 5357 |
| 61S | 6061 |
| Alclad 61S | Alclad 6061 |
| 62S | 6062 |
| 63S | 6063 |
| 72S | 7072 |
| 75S | 7075 |
| Alclad 75S | Alclad 7075 |
| R301 (4) | 2014 |
| Alclad R301 | Alclad 2014 |
| R305 | 5005 |
| R306 (3) | 6003 |
| R307 | Unassigned |
| R308 (5) | 1130 |

NOTES: (1) Cladding on Alclad 2024 (Alclad 24S).
(2) Cladding on No. 2 Reflector Sheet.
(3) Cladding on Alclad 2014 (R301).
(4) A Clad Product . . . Core is 14S.
(5) Also known as No. 1 Reflector Sheet.

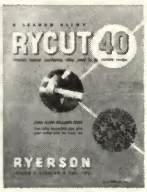
## HELPFUL RYERSON LITERATURE

The booklets and bulletins described below contain detailed information on the characteristics, applications, etc. of various steel and allied products. They will gladly be mailed to you upon request. Other Ryerson literature is frequently published, so if you are seeking more data on a product or service not shown here, please write or call us. We are anxious to help you in every way.




**Ledloy**—Illustrated booklet describing the fastest machining screw steel produced today. Gives case histories, machinability rating, tool life and mechanical properties of this leaded open hearth steel, proved in actual production to increase spindle speeds, save on tool grinding costs and down time, etc. Also included is a helpful table on cutting speeds and feeds.

**Open Steel Flooring**—Engineering data bulletin giving specifications for these strong, open steel panels used for flooring, grating and similar applications requiring the free passage of light and air, plus an illustrated listing of designs to fit your particular requirements.




**Faster Machining Leaded Alloy Steels**—Gives engineering data on Rycut—the world's fastest machining alloy steel—and includes case studies showing remarkable production increases and substantial savings in the cost of machined parts when Rycut is used to replace conventional alloys. Parts have a smoother, brighter surface and meet closer tolerances.

**Perforated Sheets and Plates**—Illustrates stock patterns, and special patterns designed to meet the requirements of industry. Available in hot rolled and cold finished, carbon and stainless qualities of sheets and plates. Also included is information on how to order your perforating requirements.

**Allegheny Stainless Steel Bars**—Illustrated bulletin describing the types of stainless bars and their uses. A helpful guide in selecting stainless bars for best machinability, good welding results, greater resistance to heat and corrosion, and parts to be hardened. Also a listing of other analyses of stainless bars shipped from mill, and information on stainless sheets, etc.

**Ryex Expanded Metal**—Bulletin offers engineering data, illustrations of applications, sizes, etc., of this diamond pattern, solid joint, regular or flattened type open steel mesh. It is used for guards, enclosures, manufactured products, concrete reinforcement, grating and general construction.

Plastic Pipe & Tubing 200

Glyco Babbit 201

## RYERTEX®
## Heavy Duty Industrial Plastic

A reinforced industrial plastic with wide spread application, Ryertex possesses remarkable strength and hardness. It is made from cloth fabric, paper, or asbestos impregnated with synthetic resins and molded under great heat and pressure into a permanently solid material.

This versatile laminated plastic is furnished in sheets, tubes and rods which can be readily fabricated and machined for innumerable applications. For special applications Ryertex is molded into most any desired shape.

Its many useful properties are suited to an unlimited number of applications in all industries: Mechanical parts, panels, washers, silent gears, pulleys—chemical and electrical parts, terminals, bobbins, valve blocks, tubing systems —bearings and bushings—are just a few Ryertex applications.

Ryerson offers a fully equipped shop for the exclusive fabrication of Ryertex. Send in a sketch or blueprint of the part you require. Or, if you prefer to do your own machining, high strength laminated sheets, tubes and rods are available for immediate shipment from Ryerson stock.

### STOCK SIZE SHEETS, TUBES, RODS

**Ryertex Sheets,** paper and fabric base are available in any thickness from $\frac{1}{32}$″ to 6″ in standard sizes:

36″x36″ 36″x42″ 36″x72″ 36″x84″ 48″x48″

36″ widths are available in larger lengths up to 300″.

**Ryertex Tubes** are in 36″ random lengths with I.D. ranging from $\frac{1}{16}$″ to 48″, in virtually any wall thickness.

**Ryertex Rod Stock** is available from $\frac{1}{4}$″ up to 6″.

Write for more explicit details on your laminated plastic application. Ryertex engineers will gladly work with you. For detailed information on mechanical and electrical properties, ask for our informative bulletin.

## PLASTIC PIPE AND TUBING

### *Flexible and Rigid*

Plastic Pipe & Tubing is extremely lightweight (*one-eighth as much as steel pipe or tubing*). Quick, economical installation is possible because of its light weight and because fabricating can be done on the job site with permanent, leakproof installations made without special tools. The flow of liquid through plastic pipe and tubing equals the flow through a steel line one size larger.

It can be used both above and below ground Rot, rust and electrolytic corrosion do not affect it. Plastic pipe is also noted for its resistance to the corroding effects of chemicals, fluids, foods, gases, vapors and wastes. Operating temperatures range from −50 to 170° F.

Plastic pipe and tubing are available in the types listed below—and can be furnished complete with plastic fittings, including molded and fabricated PVC valves. PVC sheets are also a stock item. Call or write for more information.

#### FLEXIBLE

**Type "EF" Pipe,** all-purpose plastic, is a non-toxic, tasteless polyethylene for well piping, farm watering, water service lines, food, chemical and highly corrosive fluid and vapor lines. In coils to 400 ft.

**Type "E" Pipe** is lowest in cost. A non-toxic polyethylene intended for industrial purposes. Used for mine piping, sewage, exhaust lines, electrical conduit, etc. In coils to 400 ft.

**Type "C" Tubing** is widely used in food processing and chemical industries. A non-toxic, pure polyethylene completely inert to corrosive action of food and inorganic chemicals. Unaffected by mineral acids and other highly corrosive chemicals. Available in 100 and 500 ft. *translucent* coils.

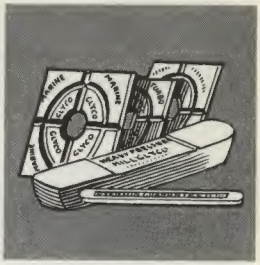
#### RIGID

**Ryertex-Omicron PVC Pipe** is a non-toxic, unplasticized, polyvinyl chloride completely free from additives or fillers. Heavy wall and maximum resistance to chemicals and sunlight fit it for many applications. Ideal for overhead lines. Schedules 40 and 80 IPS in 10 and 20 ft. lengths.

**Type "L" Pipe** has heavy walls with high impact and tensile strength. A rubber modified, styrene copolymer used indoors, outdoors and underground. Non-toxic and resistant to corrosive chemicals. Used in general piping and petroleum applications and in electrical installations. Schedules 40 and 80 IPS in 10 and 20 ft. lengths. Also other wall thicknesses.

## RYERSON GLYCO® BABBITT METAL

**Well known lead base metal of highest quality in 5 standard types and special analyses**



All of the many types of Glyco Babbit are manufactured in our own foundry from premium virgin metals. Alloying elements are controlled so that each analysis meets our exacting requirements.

All types of Glyco are carried in stock for immediate shipment packed in 50 lb. boxes.

For your convenience, brief descriptions of each type are listed below. If you need more information call your Ryerson plant or write for our technical literature.

**Turbo Glyco** is our highest grade—performing excellently under severe operating conditions. It is especially well suited for electrical machinery, turbines, or any application in which bearings are subjected to excessive pressures at high speeds. Brinell Hardness ranges from 30 to 32. Both Turbo and Marine Glyco will satisfactorily replace the more expensive tin base metals.

**Marine Glyco** is very high-grade babbitt metal for severe applications where the exceptional qualities of Turbo Glyco aren't necessary. Ideal for electric motors, generators, medium powered engines and machinery of all kinds. Brinell Hardness from 27 to 29.

**Standard Glyco** is an all-around babbitt used for general repair work and all ordinary service conditions. Brinell Hardness ranges from 23.5 to 24.5.

**Heavy Pressure Mill Glyco** is a specially developed babbit metal for heavy-duty service where operating temperatures are high. It is used for roll neck bearings in steel and cement mills and in other applications which require a high-grade but moderately priced babbitt. Brinell Hardness ranges from 24 to 26.

**Transmission Glyco** is recommended for applications where stresses are not severe and requirements do not warrant the use of a higher grade metal. It is generally used on light machinery or shafting where economy is the prime factor. Brinell Hardness ranges from 22 to 23.

**Plus 4 Babbitt** is a clean, inexpensive alloy, excellent for lead hammers, grouting foundation bolts and light duty bearings.

**Special Babbitt** is manufactured to your specifications from the finest grade of new metals. Send us your requirements. We will be happy to quote you a price.

### GLYCO TINNING COMPOUND

Used to insure a tight bond between the bearing shell and the babbitt metal. Available in 1 and 5 pound cans and 25 pound pails. Write for booklet giving complete information.

## RYERSON MACHINERY & TOOLS
## For Metal Fabrication

***Power driven and hand operated equipment for:***

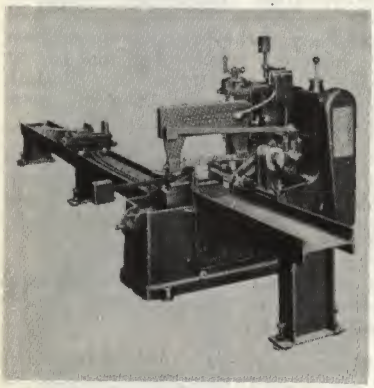
BENDING • BRAKING • DRILLING • FORMING
GRINDING • HOISTING • PRESSING • PUNCHING
ROLLING • SAWING • SHEARING • THREADING

**Dependable Machinery Service**—The fact that Ryerson has an established reputation for quality and service in the steel business is your assurance of unqualified satisfaction when you look to us for machinery and tools.

Our own experience with this type of equipment enables us to bring you job-tested machines and tools with proved performance records.

Then too, we unreservedly guarantee all Ryerson machinery and tools to be as represented and of first class material and workmanship.

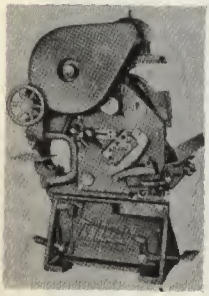
**Other Equipment**—These illustrations represent only a few of the many Ryerson machines and tools. We have a complete line of metal-working equipment and will be glad to send you literature and quote prices on the machine or tool you need.



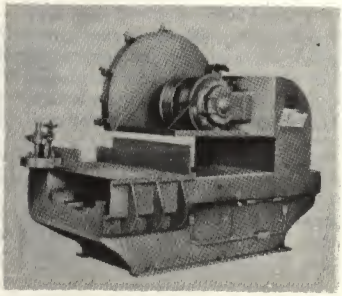
Power hack saws with up to 24" capacity, some with automatic bar push-up fixtures

Portable electric drills and screwdrivers

Hand punches and shears, all sizes



Combination Punch & Shears for shearing, punching, coping, etc.



Friction saws with horizontal or downstroke feed for production cutting, adaptable to hot sawing for mill and forge shop.

**Write for detailed information on this equipment.**

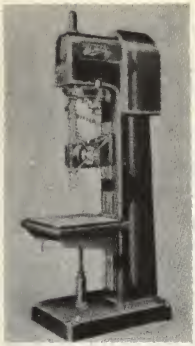
*Mach'y 202, 203*

*Chain 204*

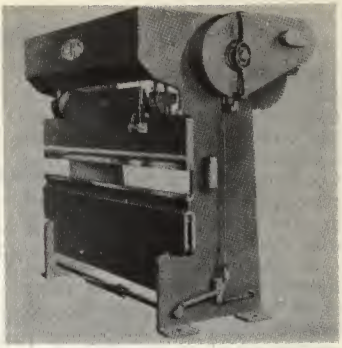
*Wire Rope 205*

*Rails 206*

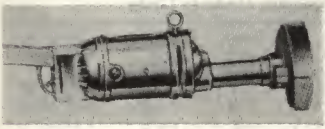
*Track Spikes & Bolts 206*



Bench and floor drill presses

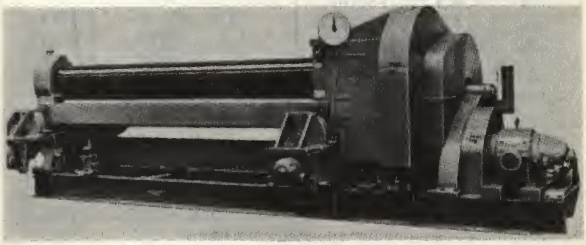


Presses all sizes, forming and press brakes

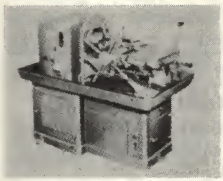


Portable electric grinders, all types

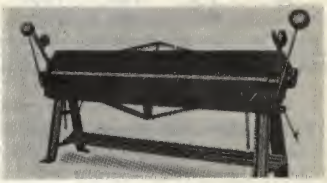
Hand punches, all sizes



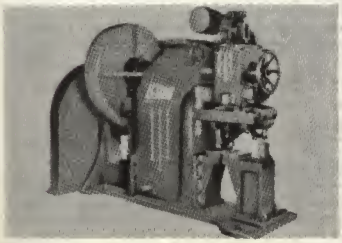
Bending rolls



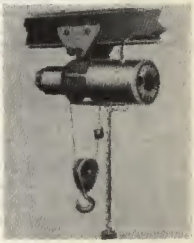
Power, pipe and bolt threaders



Hand and power brakes for sheets and plates



Power punches, all capacities



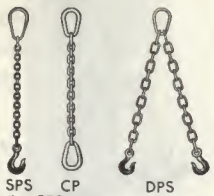
Electric and hand hoists

**Write for detailed information on this equipment.**

## SLING CHAIN—ALLOY STEEL

Taylor-Made alloy steel sling chain has *double* the Working Load Limit and Ultimate Breaking Strain of Proof Coil or BBB carbon steel chain. It also lasts 6 to 8 times longer. Users of alloy chain gain two ways: 1) Greater margin of safety, 2) Longer life with resulting savings.

In addition to the popular styles shown at right, many other types of assemblies and running lengths of chain are supplied. All are described in our chain bulletin which we will send you.



SPS CP DPS

Style SPS has pear shapeP link and sling hook. Style CP, pear shaped ring on each end. Style DPS, double sling chain with pear shaped link in center, sling hooks on free ends. For other styles refer to Ryerson bulletin.

*All Sling Assemblies are Made to Order*

| Trade Size in Inches | Weight per Foot | Safe Working Load | Trade Size in Inches | Weight per Foot | Safe Working Load |
|---|---|---|---|---|---|
| ¼ | 8 | 3250 | 1⅛ | 12.6 | 44500 |
| ⅜ | 1.6 | 6600 | 1¼ | 15.4 | 57500 |
| ½ | 2.8 | 11250 | 1⅜ | 19.3 | 67000 |
| ⅝ | 4.3 | 16500 | 1½ | 21.6 | 80000 |
| ¾ | 6.2 | 23000 | 1¾ | 29.0 | 95000 |
| ⅞ | 8.5 | 28750 | 2 | 38.4 | 105000 |
| 1 | 10.5 | 38750 | | | |

### COIL CHAIN—Carbon Steel

| Trade Size | Proof Coil Links Foot | Proof Coil Weight 100 Ft. | Proof Coil Safe Load | BBB Quality Links Foot | BBB Quality Weight 100 Ft. | BBB Quality Safe Load |
|---|---|---|---|---|---|---|
| 3/16 | 12½ | 41 | 500 | 15½ | 43 | 650 |
| ¼ | 12 | 73 | 900 | 14 | 77 | 1100 |
| 5/16 | 10⅔ | 110 | 1400 | 12 | 115 | 1700 |
| ⅜ | 9¾ | 160 | 1900 | 11 | 166 | 2300 |
| ½ | 8 | 275 | 3300 | 9 | 295 | 4100 |
| ⅝ to 1¼—*quickly available on special order* | | | | | | |

Note: Proof coil or BBB quality chain not recommended for overhead lifting

### SLING and GRAB HOOKS—Alloy Steel (Tayco Patent)

These alloy steel sling and grab hooks with I-Beam construction are specially designed for safe overhead lifting. When used with recommended loads, these strong hooks will not straighten out even if accidentally tip loaded.

| Chain Size in Inches | Hook Opening in Inches: Sling | Grab | Chain Size in Inches | Hook Opening in Inches: Sling | Grab |
|---|---|---|---|---|---|
| ¼ | 1½ | ⅜ | ¾ | 2 9/16 | |
| ⅜ | 1 1/16 | ½ | ⅞ | 3 1/16 | .. |
| ½ | 1 5/16 | ⅝ | 1 | 3 9/16 | .. |
| ⅝ | 2 1/16 | ¾ | 1⅛ | 3 9/16 | |

### SLIP and GRAB HOOKS—Carbon Steel (Clevis Type)

| Chain Size in Inches | Hook Reach in Inches: Slip | Grab | Chain Size in Inches | Hook Reach in Inches: Slip | Grab |
|---|---|---|---|---|---|
| ¼ | 2⅜ | 2⅛ | ⅜ | 3¼ | 2¾ |
| 5/16 | 2¾ | 2½ | ½ | 4 | 3¾ |

*These hooks are not recommended for overhead lifting.*

## WIRE ROPE

We furnish a complete line of Wire Rope in all sizes, types and constructions, including standard hoisting and extra-pliable rope. Both fiber and independent wire rope cores are furnished. We also supply all types of slings and fittings.

### STANDARD STEEL HOISTING ROPE

PREFORMED AND NON-PREFORMED

**6 x 19 Classification**

6 Strands and Fiber Core, 19 to 25 Wires per Strand

| Diam. in Inches | Approx. Wt. per Ft., Lbs. | Break Strength in Tons | Diam. in Inches | Approx. Wt. per Ft., Lbs. | Break Strength in Tons | Diam. in Inches | Approx. Wt. per Ft., Lbs. | Break Strength in Tons |
|---|---|---|---|---|---|---|---|---|
| 1/4 | .10 | 2.74 | 7/8 | 1.23 | 32.2 | 1 3/4 | 4.90 | 124.0 |
| 5/16 | .16 | 4.26 | 1 | 1.60 | 41.8 | 1 7/8 | 5.63 | 141.0 |
| 3/8 | .23 | 6.10 | 1 1/8 | 2.03 | 52.6 | 2 | 6.40 | 160.0 |
| 7/16 | .31 | 8.27 | 1 1/4 | 2.50 | 64.6 | 2 1/8 | 7.23 | 179.0 |
| 1/2 | .40 | 10.7 | 1 3/8 | 3.03 | 77.7 | 2 1/4 | 8.10 | 200.0 |
| 9/16 | .51 | 13.5 | 1 1/2 | 3.60 | 92.0 | 2 1/2 | 10.00 | 244.0 |
| 5/8 | .63 | 16.7 | 1 5/8 | 4.23 | 107.0 | 2 3/4 | 12.10 | 292.0 |
| 3/4 | .90 | 23.8 | | | | | | |

**6 x 37 Classification**

6 Strands and Fiber Core, 26 to 46 Wires per Strand

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1/4 | .10 | 2.59 | 1 | 1.55 | 39.8 | 2 | 6.20 | 154.0 |
| 5/16 | .16 | 4.03 | 1 1/8 | 1.96 | 50.1 | 2 1/8 | 7.00 | 173.0 |
| 3/8 | .22 | 5.77 | 1 1/4 | 2.42 | 61.5 | 2 1/4 | 7.85 | 193.0 |
| 7/16 | .30 | 7.82 | 1 3/8 | 2.93 | 74.1 | 2 1/2 | 9.69 | 236.0 |
| 1/2 | .39 | 10.2 | 1 1/2 | 3.49 | 87.9 | 2 3/4 | 11.72 | 284.0 |
| 9/16 | .49 | 12.9 | 1 5/8 | 4.09 | 103.0 | 3 | 13.95 | 335.0 |
| 5/8 | .61 | 15.8 | 1 3/4 | 4.75 | 119.0 | 3 1/4 | 16.37 | 390.0 |
| 3/4 | .87 | 22.6 | 1 7/8 | 5.45 | 136.0 | 3 1/2 | 19.00 | 449.0 |
| 7/8 | 1.19 | 30.6 | | | | | | |

NOTE—When wire rope is galvanized, deduct 10% from break strengths shown. For ropes made with wire strand core or independent wire rope core, add 10% to weights and 7% to breaking strengths.

**WIRE ROPE SLINGS**—Made from high-strength steel and designed for every kind of hoisting job. Included are "Flat-weave" 6-part slings, equalizing bridle slings, and "All-Purpose" slings with tapered sleeve splices.

### HERE'S WHAT YOU SHOULD KNOW ABOUT WIRE ROPE

**Wire Rope Must Possess:**

1. STRENGTH—Determined by size, grade and construction, the wires are made in tensile strengths ranging from iron at approx. 100,000 psi to improved plow steel at approx. 250,000 psi.
2. FATIGUE RESISTANCE—Made from wire fabricated for this purpose, ropes composed of a large number of small wires have higher fatigue resitance than those made with a smaller number of large wires.
3. ABRASION RESISTANCE—Determined by size and chemistry of the wires. Larger wire sizes and higher strength steels give greater resistance to abrasion and wear.

**Getting the Right Balance**—Individually, strength, fatigue resistance and abrasion resistance are not difficult to obtain, but it is impossible to accent one property without detriment to the other two. That's why the skill and experience of men who know Wire Rope are so important in obtaining an effective balance to meet the requirements of your particular job.

**Wire Rope Specialists**—Good operating practices are necessary for longer Wire Rope life. Call in your Ryerson Specialist at regular intervals and have him give your wire rope a free check-up. He is thoroughly experienced with the proper applications.

## RAILS

Open Hearth, New Billet Steel—ASCE Sections

| Wt. per Yard Lbs. | Section No. | Height in Inches | Width of Base | Width of Head | Stock Lengths, Ft. | Track Bolts to Be Used | Track Spikes to Be Used |
|---|---|---|---|---|---|---|---|
| 25 | 2540 | 2¾ | 2¾ | 1½ | 20,30 | ½x2¼ | ½x4 |
| 30 | 3040 | 3⅛ | 3⅛ | 1 11/16 | 20,30 | ⅝x2½ | ½x4 |
| 40 | 4040 | 3½ | 3½ | 1⅞ | 20,30 | ¾x3 | ½x5 |
| 60 | 6040 | 4¼ | 4¼ | 2⅜ | 33 | ¾x3¾ | 9/16x5½ |
| 80 | 8040 | 5 | 5 | 2½ | 39 | ⅞x4⅛ | 9/16x5½ |

## RAIL CLIPS

No. 103—Oval Hole • No. 114—Round Hole

| Clip No. | Clip Size in Inches | Clip Hole in Inches | Bolt Size in Inches | Wt. in Lbs. Clip Wt. | Bolt Wt. | Total Wt. | A.S.C.E. Rails in Lbs. |
|---|---|---|---|---|---|---|---|
| 103 | 2¼ x2 | 1 1/16x23/32 | ¾x2¼ | 0.58 | 0.66 | 1.24 | 55-100 |
| 114 | 1 11/16x1½ | 21/32 | ⅝x1¾ | 0.24 | 0.41 | 0.65 | 20- 50 |

## JOINT BARS

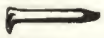
All Joint Bars in the table below have 4 holes.

| Rail Size Lbs. | Weight per Pair in Lbs. without Bolts | Track Bolts to Be Used (4 per Pair) | Weight per Pair in Lbs. with Bolts | Length in Inches |
|---|---|---|---|---|
| *25 | 5.70 | ½x2¼ | 6.57 | 16⅛ |
| 30 | 10.45 | ⅝x2½ | 11.97 | 16⅛ |
| 40 | 16.10 | ¾x3 | 18.64 | 20 |
| 60 | 32.40 | ¾x3¾ | 35.25 | 24 |
| 80 | 44.10 | ⅞x4⅛ | 48.64 | 24 |

* Rail Splice. All other sizes are Angle Bars.

## TRACK SPIKES *(In 200 Lb. kegs)*

ASTM-A-65-54, AREA-1934



| Size in Inches | Number of Spikes in each Keg | Size in Inches | Number of Spikes in each Keg |
|---|---|---|---|
| ⅜x2½ | 1470 | 9/16x5 | 365 |
| ½x3½ | 638 | 9/16x5½ | 335 |
| ½x4 | 550 | ⅝x5½ | 264 |
| ½x5 | 460 | ⅝x6 | 244 |

## TRACK BOLTS *(In 200 Lb. kegs)*

ASTM—A-76-49T

| Bolt Size in Inches | Wt. per Bolt in Lbs. | Quantity per Keg | Bolt Size in Inches | Wt. per Bolt in Lbs. | Quantity per Keg |
|---|---|---|---|---|---|
| ½x2¼ | .21785 | 918 | ¾x3¾ | .7434 | 269 |
| ⅝x2½ | .38094 | 525 | ⅞x4⅛ | 1.136 | 176 |
| ¾x3 | .66440 | 301 | | | |

*American Standard Heavy Square Nuts are available for each bolt size.*

**Metal Workers Marking Crayons** *Genuine talc in one gross boxes*

| | |
|---|---|
| ¼" Round by 5" long | 3/16"x1¼" by 5" long |
| ¼" Square by 5" long | 3/16"x ½" by 5" long |

**Markal Paint Sticks**—Two types are carried in stock. Type C for marking cold surfaces (packed 12 to a package, 12 packages to a gross carton). Type H for marking hot surfaces up to 1500°F. (packed 36 to a package, 4 packages to a gross carton).

# WEIGHT OF ROUND STEEL BARS

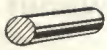
In Pounds

| Size in Inches | Per Ft. | 12′ Bar | 16′ Bar | 18′ Bar | 20′ Bar |
|---|---|---|---|---|---|
| 1/16 | .010 | 0.120 | 0.16 | 0.180 | 0.200 |
| 5/64 | .016 | 0.192 | 0.256 | 0.288 | 0.320 |
| 3/32 | .023 | 0.276 | 0.368 | 0.414 | 0.460 |
| 7/64 | .032 | 0.384 | 0.512 | 0.576 | 0.640 |
| 1/8 | .042 | 0.504 | 0.672 | 0.756 | 0.840 |
| 9/64 | .053 | 0.636 | 0.848 | 0.954 | 1.06 |
| 5/32 | .065 | 0.780 | 1.04 | 1.17 | 1.30 |
| 11/64 | .079 | 0.948 | 1.26 | 1.42 | 1.58 |
| 3/16 | .094 | 1.13 | 1.50 | 1.69 | 1.88 |
| 13/64 | .110 | 1.32 | 1.76 | 1.98 | 2.20 |
| 7/32 | .128 | 1.54 | 2.05 | 2.30 | 2.56 |
| 15/64 | .147 | 1.76 | 2.35 | 2.65 | 2.94 |
| 1/4 | .167 | 2.00 | 2.67 | 3.01 | 3.34 |
| 17/64 | .188 | 2.26 | 3.01 | 3.38 | 3.76 |
| 9/32 | .211 | 2.53 | 3.38 | 3.80 | 4.22 |
| 19/64 | .235 | 2.82 | 3.76 | 4.23 | 4.70 |
| 5/16 | .261 | 3.13 | 4.18 | 4.70 | 5.22 |
| 21/64 | .288 | 3.46 | 4.61 | 5.18 | 5.76 |
| 11/32 | .316 | 3.79 | 5.06 | 5.69 | 6.32 |
| 23/64 | .345 | 4.14 | 5.52 | 6.21 | 6.90 |
| 3/8 | .376 | 4.51 | 6.02 | 6.77 | 7.52 |
| 25/64 | .408 | 4.90 | 6.53 | 7.34 | 8.16 |
| 13/32 | .441 | 5.29 | 7.06 | 7.94 | 8.82 |
| 27/64 | .475 | 5.70 | 7.60 | 8.55 | 9.50 |
| 7/16 | .511 | 6.13 | 8.18 | 9.20 | 10.22 |
| 29/64 | .548 | 6.58 | 8.77 | 9.86 | 10.96 |
| 15/32 | .587 | 7.04 | 9.39 | 10.57 | 11.74 |
| 31/64 | .627 | 7.52 | 10.03 | 11.29 | 12.54 |
| 1/2 | .668 | 8.02 | 10.69 | 12.02 | 13.36 |
| 33/64 | .710 | 8.52 | 11.36 | 12.78 | 14.20 |
| 17/32 | .754 | 9.05 | 12.06 | 13.57 | 15.08 |
| 35/64 | .799 | 9.59 | 12.78 | 14.38 | 15.98 |
| 9/16 | .845 | 10.14 | 13.52 | 15.21 | 16.90 |
| 37/64 | .893 | 10.72 | 14.29 | 16.07 | 17.86 |
| 19/32 | .941 | 11.29 | 15.06 | 16.94 | 18.82 |
| 39/64 | .992 | 11.90 | 15.87 | 17.86 | 19.84 |
| 5/8 | 1.04 | 12.48 | 16.64 | 18.72 | 20.80 |
| 41/64 | 1.10 | 13.20 | 17.60 | 19.80 | 22.00 |
| 21/32 | 1.15 | 13.80 | 18.40 | 20.70 | 23.00 |
| 1 1/16 | 1.26 | 15.12 | 20.16 | 22.68 | 25.20 |
| 23/32 | 1.38 | 16.56 | 22.08 | 24.84 | 27.60 |
| 47/64 | 1.44 | 17.28 | 23.04 | 25.92 | 28.80 |
| 3/4 | 1.50 | 18.00 | 24.00 | 27.00 | 30.00 |
| 49/64 | 1.57 | 18.84 | 25.12 | 28.26 | 31.40 |
| 25/32 | 1.63 | 19.56 | 26.08 | 29.34 | 32.60 |
| 13/16 | 1.76 | 21.12 | 28.16 | 31.68 | 35.2 |
| 27/32 | 1.90 | 22.80 | 30.40 | 34.20 | 38.0 |
| 7/8 | 2.04 | 24.48 | 32.64 | 36.72 | 40.8 |
| 29/32 | 2.19 | 26.28 | 35.04 | 39.42 | 43.8 |
| 15/16 | 2.35 | 28.20 | 37.60 | 42.30 | 47.0 |
| 31/32 | 2.51 | 30.12 | 40.16 | 45.18 | 50.2 |
| 1 | 2.67 | 32.04 | 42.72 | 48.06 | 53.4 |
| 1 1/32 | 2.84 | 34.08 | 45.44 | 51.12 | 56.8 |
| 1 1/16 | 3.01 | 36.12 | 48.16 | 54.18 | 60.2 |
| 1 1/8 | 3.38 | 40.56 | 54.08 | 60.84 | 67.6 |
| 1 3/16 | 3.77 | 45.24 | 60.32 | 67.86 | 75.4 |
| 1 1/4 | 4.17 | 50.04 | 66.72 | 75.06 | 83.4 |
| 1 5/16 | 4.60 | 55.20 | 73.60 | 82.80 | 92.0 |
| 1 3/8 | 5.05 | 60.60 | 80.80 | 90.90 | 101.0 |
| 1 7/16 | 5.52 | 66.24 | 88.32 | 99.36 | 110.4 |
| 1 1/2 | 6.01 | 72.12 | 96.16 | 108.18 | 120.2 |
| 1 9/16 | 6.52 | 78.24 | 104.32 | 117.36 | 130.4 |
| 1 5/8 | 7.05 | 84.60 | 112.80 | 126.90 | 141.0 |
| 1 11/16 | 7.60 | 91.20 | 121.60 | 136.80 | 152.0 |
| 1 3/4 | 8.18 | 98.16 | 130.88 | 147.24 | 163.6 |
| 1 13/16 | 8.77 | 105.24 | 140.32 | 157.86 | 175.4 |
| 1 7/8 | 9.39 | 112.68 | 150.24 | 169.02 | 187.8 |
| 1 15/16 | 10.02 | 120.24 | 160.32 | 180.36 | 200.4 |
| 2 | 10.68 | 128.16 | 170.88 | 192.24 | 213.6 |
| 2 1/16 | 11.36 | 136.32 | 181.76 | 204.48 | 227.2 |
| 2 1/8 | 12.06 | 144.72 | 192.96 | 217.08 | 241.2 |
| 2 3/16 | 12.78 | 153.36 | 204.48 | 230.04 | 255.6 |

(Continued)

## WEIGHT OF ROUND STEEL BARS

In Pounds



| Size in Inches | Per Ft. | 12′ Bar | 16′ Bar | 18′ Bar | 20′ Bar |
|---|---|---|---|---|---|
| (Continued) | | | | | |
| 2 1/4 | 13.52 | 162.24 | 216.32 | 243.36 | 270.4 |
| 2 5/16 | 14.28 | 171.36 | 228.48 | 257.04 | 285.6 |
| 2 3/8 | 15.06 | 180.72 | 240.96 | 271.08 | 301.2 |
| 2 7/16 | 15.87 | 190.44 | 253.92 | 285.66 | 317.4 |
| 2 1/2 | 16.69 | 200.28 | 267.04 | 300.42 | 333.8 |
| 2 9/16 | 17.53 | 210.36 | 280.48 | 315.54 | 350.6 |
| 2 5/8 | 18.40 | 220.80 | 294.40 | 331.20 | 368.0 |
| 2 11/16 | 19.29 | 231.48 | 308.64 | 347.22 | 385.8 |
| 2 3/4 | 20.19 | 242.28 | 323.04 | 363.42 | 403.8 |
| 2 13/16 | 21.12 | 253.44 | 337.92 | 380.16 | 422.4 |
| 2 7/8 | 22.07 | 264.84 | 353.12 | 397.26 | 441.4 |
| 2 15/16 | 23.04 | 276.48 | 368.64 | 414.72 | 460.8 |
| **3** | 24.03 | 288.36 | 384.48 | 432.54 | 480.6 |
| 3 1/16 | 25.05 | 300.60 | 400.80 | 450.90 | 501.0 |
| 3 1/8 | 26.08 | 312.96 | 417.28 | 469.44 | 521.6 |
| 3 3/16 | 27.13 | 325.56 | 434.08 | 488.34 | 542.6 |
| 3 1/4 | 28.21 | 338.52 | 451.36 | 507.78 | 564.2 |
| 3 5/16 | 29.30 | 351.60 | 468.80 | 527.40 | 586.0 |
| 3 3/8 | 30.42 | 365.04 | 486.72 | 547.56 | 608.4 |
| 3 7/16 | 31.55 | 378.60 | 504.80 | 567.90 | 631.0 |
| 3 1/2 | 32.71 | 392.52 | 523.36 | 588.78 | 654.2 |
| 3 9/16 | 33.89 | 406.68 | 542.24 | 610.02 | 677.8 |
| 3 5/8 | 35.09 | 421.08 | 561.44 | 631.62 | 701.8 |
| 3 11/16 | 36.31 | 435.72 | 580.96 | 653.58 | 726.2 |
| 3 3/4 | 37.55 | 450.60 | 600.80 | 675.90 | 751.0 |
| 3 13/16 | 38.81 | 465.72 | 620.96 | 698.58 | 776.2 |
| 3 7/8 | 40.10 | 481.20 | 641.60 | 721.80 | 802.0 |
| 3 15/16 | 41.40 | 496.80 | 662.40 | 745.20 | 828.0 |
| **4** | 42.73 | 512.76 | 683.68 | 769.14 | 854.6 |
| 4 1/16 | 44.07 | 528.84 | 705.12 | 793.26 | 881.4 |
| 4 1/8 | 45.44 | 545.28 | 727.04 | 817.92 | 908.8 |
| 4 3/16 | 46.83 | 561.96 | 749.28 | 842.94 | 936.6 |
| 4 1/4 | 48.23 | 578.76 | 771.68 | 868.14 | 964.6 |
| 4 5/16 | 49.66 | 595.92 | 794.56 | 893.88 | 993.2 |
| 4 3/8 | 51.11 | 613.32 | 817.76 | 919.98 | 1022.2 |
| 4 7/16 | 52.58 | 630.96 | 841.28 | 946.44 | 1051.6 |
| 4 1/2 | 54.08 | 648.96 | 865.28 | 973.44 | 1081.6 |
| 4 9/16 | 55.59 | 667.08 | 889.44 | 1000.62 | 1111.8 |
| 4 5/8 | 57.12 | 685.44 | 913.92 | 1028.16 | 1142.4 |
| 4 11/16 | 58.68 | 704.16 | 938.88 | 1056.24 | 1173.6 |
| 4 3/4 | 60.25 | 723.00 | 964.00 | 1084.50 | 1205.0 |
| 4 7/8 | 63.46 | 761.52 | 1015.36 | 1142.28 | 1269.2 |
| 4 15/16 | 65.10 | 781.20 | 1041.60 | 1171.80 | 1302.0 |
| **5** | 66.76 | 801.12 | 1068.16 | 1201.68 | 1335.2 |
| 5 1/8 | 70.14 | 841.68 | 1122.24 | 1262.52 | 1402.8 |
| 5 1/4 | 73.60 | 883.20 | 1177.60 | 1324.80 | 1472.0 |
| 5 5/16 | 75.36 | 904.32 | 1205.76 | 1356.48 | 1507.2 |
| 5 3/8 | 77.15 | 925.80 | 1234.40 | 1388.70 | 1543.0 |
| 5 7/16 | 78.95 | 947.40 | 1263.20 | 1421.10 | 1579.0 |
| 5 1/2 | 80.78 | 969.36 | 1292.48 | 1454.04 | 1615.6 |
| 5 5/8 | 84.49 | 1013.88 | 1351.84 | 1520.82 | 1689.8 |
| 5 3/4 | 88.29 | 1059.48 | 1412.64 | 1589.22 | 1765.8 |
| 5 7/8 | 92.17 | 1106.04 | 1474.72 | 1659.06 | 1843.4 |
| 5 15/16 | 94.14 | 1129.68 | 1506.24 | 1694.52 | 1882.8 |
| **6** | 96.13 | 1153.56 | 1538.08 | 1730.34 | 1922.6 |
| 6 1/4 | 104.31 | 1251.72 | 1668.96 | 1877.58 | 2086.2 |
| 6 1/2 | 112.82 | 1353.84 | 1805.12 | 2030.76 | 2256.4 |
| 6 3/4 | 121.67 | 1460.04 | 1946.72 | 2190.06 | 2433.4 |
| **7** | 130.85 | 1570.20 | 2093.60 | 2355.30 | 2617.0 |
| 7 1/4 | 140.36 | 1684.32 | 2245.76 | 2526.48 | 2807.2 |
| 7 1/2 | 150.21 | 1802.52 | 2403.36 | 2703.78 | 3004.2 |
| 7 3/4 | 160.39 | 1924.68 | 2566.24 | 2887.02 | 3207.8 |
| **8** | 170.90 | 2050.80 | 2734.40 | 3076.20 | 3418.0 |
| 8 1/2 | 192.93 | 2315.16 | 3086.88 | 3472.74 | 3858.6 |
| 9 | 216.30 | 2595.60 | 3460.80 | 3893.40 | 4326.0 |
| 9 1/2 | 241.00 | 2892.00 | 3856.00 | 4338.00 | 4820.0 |
| **10** | 267.04 | 3204.48 | 4272.64 | 4806.72 | 5340.8 |
| 10 1/2 | 294.41 | 3532.92 | 4710.56 | 5299.38 | 5888.2 |
| 11 | 323.11 | 3877.32 | 5169.76 | 5815.98 | 6462.2 |
| 11 1/2 | 353.15 | 4237.80 | 5650.40 | 6356.70 | 7063.0 |
| 12 | 384.53 | 4614.36 | 6152.48 | 6921.54 | 7690.6 |
| **13** | 451.29 | 5415.48 | 7220.64 | 8123.22 | 9025.8 |

# WEIGHT OF SQUARE and HEXAGON STEEL BARS

In Pounds

| Size in Inches | Square Bars | | | | | Hexagon Bars | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Per Ft. | 12′ Bar | 16′ Bar | 18′ Bar | 20′ Bar | Per Ft. | 12′ Bar | 16′ Bar | 20′ Bar |
| 1/8 | .053 | .64 | .85 | .954 | 1.06 | .046 | .55 | .74 | .92 |
| 5/32 | .083 | 1.00 | 1.33 | 1.49 | 1.66 | .072 | .86 | 1.15 | 1.44 |
| 3/16 | .120 | 1.44 | 1.92 | 2.16 | 2.40 | .104 | 1.25 | 1.66 | 2.08 |
| 7/32 | .163 | 1.96 | 2.61 | 2.93 | 3.26 | .141 | 1.69 | 2.26 | 2.82 |
| 1/4 | .213 | 2.56 | 3.41 | 3.83 | 4.26 | .184 | 2.21 | 2.94 | 3.68 |
| 9/32 | .269 | 3.23 | 4.30 | 4.84 | 5.38 | .233 | 2.80 | 3.73 | 4.66 |
| 5/16 | .332 | 3.98 | 5.31 | 5.98 | 6.64 | .288 | 3.46 | 4.61 | 5.76 |
| 11/32 | .402 | 4.82 | 6.43 | 7.24 | 8.04 | .348 | 4.18 | 5.57 | 6.96 |
| 3/8 | .478 | 5.74 | 7.65 | 8.60 | 9.56 | .414 | 4.97 | 6.62 | 8.28 |
| 7/16 | .651 | 7.81 | 10.42 | 11.72 | 13.02 | .564 | 6.77 | 9.02 | 11.28 |
| 1/2 | .850 | 10.20 | 13.60 | 15.30 | 17.00 | .736 | 8.83 | 11.78 | 14.72 |
| 9/16 | 1.08 | 12.96 | 17.28 | 19.44 | 21.60 | .932 | 11.18 | 14.91 | 18.64 |
| 19/32 | 1.20 | 14.40 | 19.20 | 21.60 | 24.00 | ... | ... | ... | ... |
| 5/8 | 1.33 | 15.96 | 21.28 | 23.94 | 26.60 | 1.15 | 13.80 | 18.40 | 23.00 |
| 11/16 | 1.61 | 19.32 | 25.76 | 28.98 | 32.20 | 1.39 | 16.68 | 22.24 | 27.80 |
| 3/4 | 1.91 | 22.92 | 30.56 | 34.38 | 38.20 | 1.66 | 19.92 | 26.56 | 33.20 |
| 13/16 | 2.24 | 26.88 | 35.84 | 40.32 | 44.80 | 1.94 | 23.28 | 31.04 | 38.80 |
| 7/8 | 2.60 | 31.20 | 41.60 | 46.80 | 52.00 | 2.25 | 27.00 | 36.00 | 45.00 |
| 15/16 | 2.99 | 35.88 | 47.84 | 53.82 | 59.80 | 2.59 | 31.08 | 41.44 | 51.80 |
| 1 | 3.40 | 40.80 | 54.40 | 61.20 | 68.00 | 2.94 | 35.28 | 47.04 | 58.80 |
| 1 1/16 | 3.84 | 46.08 | 61.44 | 69.12 | 76.80 | 3.32 | 39.84 | 53.12 | 66.40 |
| 1 1/8 | 4.30 | 51.60 | 68.80 | 77.40 | 86.00 | 3.73 | 44.76 | 59.68 | 74.60 |
| 1 3/16 | 4.80 | 57.60 | 76.80 | 86.40 | 96.00 | 4.15 | 49.80 | 66.40 | 83.00 |
| 1 1/4 | 5.31 | 63.72 | 84.96 | 95.58 | 106.20 | 4.60 | 55.20 | 73.60 | 92.00 |
| 1 5/16 | 5.86 | 70.32 | 93.76 | 105.48 | 117.20 | 5.07 | 60.84 | 81.12 | 101.40 |
| 1 3/8 | 6.43 | 77.16 | 102.88 | 115.74 | 128.60 | 5.57 | 66.84 | 89.12 | 111.40 |
| 1 7/16 | 7.03 | 84.36 | 112.48 | 126.54 | 140.60 | 6.09 | 73.08 | 97.44 | 121.80 |
| 1 1/2 | 7.65 | 91.80 | 122.40 | 137.70 | 153.00 | 6.63 | 79.56 | 106.08 | 132.60 |
| 1 9/16 | 8.30 | 99.60 | 132.80 | 149.40 | 166.00 | 7.19 | 86.28 | 115.04 | 143.80 |
| 1 5/8 | 8.98 | 107.76 | 143.68 | 161.64 | 179.60 | 7.78 | 93.36 | 124.48 | 155.60 |
| 1 11/16 | 9.68 | 116.16 | 154.88 | 174.24 | 193.60 | 8.39 | 100.68 | 134.24 | 167.80 |
| 1 3/4 | 10.41 | 124.92 | 166.56 | 187.38 | 208.20 | 9.02 | 108.24 | 144.32 | 180.40 |
| 1 13/16 | 11.17 | 134.04 | 178.72 | 201.06 | 223.40 | 9.67 | 116.04 | 154.72 | 193.40 |
| 1 7/8 | 11.95 | 143.40 | 191.20 | 215.10 | 239.00 | 10.35 | 124.20 | 165.60 | 207.00 |
| 1 15/16 | 12.76 | 153.12 | 204.16 | 229.68 | 255.20 | 11.05 | 132.60 | 176.80 | 221.00 |
| 2 | 13.60 | 163.20 | 217.60 | 244.80 | 272.00 | 11.78 | 141.36 | 188.48 | 235.60 |
| 2 1/16 | 14.46 | 173.52 | 231.36 | 260.28 | 289.20 | 12.53 | 150.36 | 200.48 | 250.60 |
| 2 1/8 | 15.35 | 184.20 | 245.60 | 276.30 | 307.00 | 13.30 | 159.60 | 212.80 | 266.00 |
| 2 3/16 | 16.27 | 195.24 | 260.32 | 292.86 | 325.40 | 14.09 | 169.08 | 225.44 | 281.80 |
| 2 1/4 | 17.21 | 206.52 | 275.36 | 309.78 | 344.20 | 14.91 | 178.92 | 238.56 | 298.20 |
| 2 5/16 | 18.18 | 218.16 | 290.88 | 327.24 | 363.60 | 15.75 | 189.00 | 252.00 | 315.00 |
| 2 3/8 | 19.18 | 230.16 | 306.88 | 345.24 | 383.60 | 16.61 | 199.32 | 265.72 | 332.20 |
| 2 7/16 | 20.20 | 242.40 | 323.20 | 363.60 | 404.00 | 17.49 | 209.88 | 279.84 | 349.80 |
| 2 1/2 | 21.25 | 255.00 | 340.00 | 382.50 | 425.00 | 18.40 | 220.80 | 294.40 | 368.00 |
| 2 9/16 | 22.33 | 267.96 | 357.28 | 401.94 | 446.60 | 19.34 | 232.08 | 309.44 | 386.80 |
| 2 5/8 | 23.43 | 281.16 | 374.88 | 421.74 | 468.60 | 20.29 | 243.48 | 324.64 | 405.80 |
| 2 3/4 | 25.71 | 308.52 | 411.36 | 462.78 | 514.20 | 22.27 | 267.24 | 356.32 | 445.40 |
| 2 7/8 | 28.10 | 337.20 | 449.60 | 505.80 | 562.00 | 24.34 | 292.08 | 389.44 | 486.80 |
| 3 | 30.60 | 367.20 | 489.60 | 550.80 | 612.00 | 26.50 | 318.00 | 424.00 | 530.00 |
| 3 1/8 | 33.20 | 398.40 | 531.20 | 597.60 | 664.00 | 28.76 | 345.12 | 460.16 | 575.20 |
| 3 1/4 | 35.91 | 430.92 | 574.56 | 646.38 | 718.20 | 31.10 | 373.20 | 497.60 | 622.00 |
| 3 3/8 | 38.73 | 464.76 | 619.68 | 697.14 | 774.60 | 33.54 | 402.48 | 536.64 | 670.80 |
| 3 1/2 | 41.65 | 499.80 | 666.40 | 749.70 | 833.00 | 36.07 | 432.84 | 577.12 | 721.40 |
| 3 3/4 | 47.81 | 573.72 | 764.96 | 860.58 | 956.20 | 91.41 | 496.92 | 662.56 | 828.20 |
| 4 | 54.40 | 652.80 | 870.40 | 979.20 | 1088.00 | 47.11 | 565.32 | 753.76 | 942.20 |
| 4 1/2 | 68.85 | 826.20 | 1101.60 | 1239.30 | 1377.00 | 59.63 | 715.56 | 954.08 | 1192.60 |
| 5 | 85.00 | 1020.00 | 1360.00 | 1530.00 | 1700.00 | ... | ... | ... | ... |
| 6 | 122.40 | 1468.80 | 1958.40 | 2203.20 | 2448.00 | ... | ... | ... | ... |

# WEIGHT OF FLAT STEEL BARS

In Pounds

| Size in Inches | Per Ft. | 12′ Bar | 16′ Bar | 20′ Bar |
|---|---|---|---|---|
| **3/32x** | | | | |
| ¼ | 0.080 | 0.96 | 1.28 | 1.60 |
| ⅜ | 0.120 | 1.44 | 1.92 | 2.40 |
| ½ | 0.159 | 1.91 | 2.54 | 3.18 |
| ⅝ | 0.199 | 2.39 | 3.18 | 3.98 |
| ¾ | 0.239 | 2.87 | 3.82 | 4.78 |
| ⅞ | 0.279 | 3.35 | 4.46 | 5.58 |
| 1 | 0.319 | 3.83 | 5.10 | 6.38 |
| 1¼ | 0.398 | 4.78 | 6.37 | 7.96 |
| 1½ | 0.478 | 5.74 | 7.65 | 9.56 |
| 1¾ | 0.558 | 6.70 | 8.93 | 11.16 |
| 2 | 0.638 | 7.66 | 10.21 | 12.76 |
| **12 Ga.x** | | | | |
| ⅜ | 0.139 | 1.67 | 2.22 | 2.78 |
| ½ | 0.185 | 2.22 | 2.96 | 3.70 |
| ⅝ | 0.232 | 2.78 | 3.71 | 4.64 |
| ¾ | 0.278 | 3.34 | 4.45 | 5.56 |
| ⅞ | 0.324 | 3.89 | 5.18 | 6.48 |
| 1 | 0.371 | 4.45 | 5.94 | 7.42 |
| 1⅛ | 0.417 | 5.00 | 6.67 | 8.34 |
| 1¼ | 0.463 | 5.56 | 7.41 | 9.26 |
| 1⅜ | 0.510 | 6.12 | 8.16 | 10.20 |
| 1½ | 0.556 | 6.67 | 8.90 | 11.12 |
| 1¾ | 0.649 | 7.79 | 10.38 | 12.98 |
| 2 | 0.744 | 8.89 | 11.86 | 14.82 |
| 2¼ | 0.834 | 10.01 | 13.34 | 16.68 |
| 2½ | 0.927 | 11.12 | 14.83 | 18.54 |
| 2¾ | 1.019 | 12.23 | 16.30 | 20.38 |
| 3 | 1.112 | 13.34 | 17.79 | 22.24 |
| 3½ | 1.297 | 15.56 | 20.75 | 25.94 |
| 4 | 1.482 | 17.78 | 23.71 | 29.64 |
| **1/8x** | | | | |
| 3/16 | 0.080 | 0.96 | 1.28 | 1.60 |
| ¼ | 0.106 | 1.27 | 1.70 | 2.12 |
| 5/16 | 0.133 | 1.60 | 2.13 | 2.66 |
| ⅜ | 0.159 | 1.91 | 2.54 | 3.18 |
| ½ | 0.213 | 2.56 | 3.41 | 4.26 |
| ⅝ | 0.266 | 3.19 | 4.26 | 5.32 |
| ¾ | 0.319 | 3.83 | 5.10 | 6.38 |
| ⅞ | 0.372 | 4.46 | 5.95 | 7.44 |
| 1 | 0.425 | 5.10 | 6.80 | 8.50 |
| 1⅛ | 0.478 | 5.74 | 7.65 | 9.56 |
| 1¼ | 0.531 | 6.37 | 8.50 | 10.62 |
| 1⅜ | 0.584 | 7.01 | 9.34 | 11.68 |
| 1½ | 0.638 | 7.66 | 10.21 | 12.76 |
| 1⅝ | 0.691 | 8.29 | 11.06 | 13.82 |
| 1¾ | 0.744 | 8.93 | 11.90 | 14.88 |
| 2 | 0.850 | 10.20 | 13.60 | 17.00 |
| 2¼ | 0.956 | 11.47 | 15.30 | 19.12 |
| 2½ | 1.063 | 12.76 | 17.01 | 21.26 |
| 2¾ | 1.169 | 14.03 | 18.70 | 23.38 |
| 3 | 1.275 | 15.30 | 20.40 | 25.50 |
| 3¼ | 1.381 | 16.57 | 22.10 | 27.62 |
| 3½ | 1.488 | 17.86 | 23.81 | 29.76 |
| 3¾ | 1.594 | 19.13 | 25.50 | 31.88 |
| 4 | 1.700 | 20.40 | 27.20 | 34.00 |
| 4½ | 1.913 | 22.96 | 30.61 | 38.26 |
| 5 | 2.125 | 25.50 | 34.00 | 42.50 |
| 5½ | 2.338 | 28.06 | 37.41 | 46.76 |
| 6 | 2.550 | 30.60 | 40.80 | 51.00 |
| 7 | 2.975 | 35.70 | 47.60 | 59.50 |
| 8 | 3.400 | 40.80 | 54.40 | 68.00 |
| 9 | 3.825 | 45.90 | 61.20 | 76.50 |
| 10 | 4.250 | 51.00 | 68.00 | 85.00 |
| 12 | 5.100 | 61.20 | 81.60 | 102.00 |
| **10 Ga.x** | | | | |
| ⅜ | 0.171 | 2.05 | 2.74 | 3.42 |
| ½ | 0.228 | 2.74 | 3.65 | 4.56 |
| ⅝ | 0.285 | 3.42 | 4.56 | 5.70 |
| ¾ | 0.342 | 4.10 | 5.47 | 6.84 |
| ⅞ | 0.399 | 4.79 | 6.38 | 7.98 |
| 1 | 0.456 | 5.47 | 7.30 | 9.12 |
| 1⅛ | 0.513 | 6.16 | 8.21 | 10.26 |
| 1¼ | 0.570 | 6.84 | 9.12 | 11.40 |
| 1⅜ | 0.627 | 7.52 | 10.03 | 12.54 |
| 1½ | 0.683 | 8.20 | 10.93 | 13.66 |
| 1¾ | 0.797 | 9.56 | 12.75 | 15.94 |
| 2 | 0.911 | 10.93 | 14.58 | 18.22 |
| 2¼ | 1.025 | 12.30 | 16.40 | 20.50 |
| 2½ | 1.139 | 13.67 | 18.22 | 22.78 |
| 2¾ | 1.253 | 15.04 | 20.05 | 25.06 |
| 3 | 1.367 | 16.40 | 21.87 | 27.34 |
| 3¼ | 1.481 | 17.77 | 23.70 | 29.62 |
| 3½ | 1.595 | 19.14 | 25.52 | 31.90 |
| 4 | 1.822 | 21.86 | 29.15 | 36.44 |
| 4½ | 2.050 | 24.60 | 32.80 | 41.00 |
| 5 | 2.278 | 27.34 | 36.45 | 45.56 |
| 5½ | 2.506 | 30.07 | 40.10 | 50.12 |
| 6 | 2.734 | 32.81 | 43.74 | 54.68 |
| 7 | 3.189 | 38.27 | 51.02 | 63.78 |
| 8 | 3.645 | 43.74 | 58.32 | 72.90 |
| 9 | 4.100 | 49.20 | 65.60 | 82.00 |
| **5/32x** | | | | |
| ¼ | 0.133 | 1.60 | 2.13 | 2.66 |
| 5/16 | 0.166 | 1.99 | 2.66 | 3.32 |
| ⅜ | 0.199 | 2.39 | 3.18 | 3.98 |
| **3/16x** | | | | |
| ¼ | 0.159 | 1.91 | 2.54 | 3.18 |
| 5/16 | 0.199 | 2.39 | 3.18 | 3.98 |
| ⅜ | 0.239 | 2.87 | 3.82 | 4.78 |
| 7/16 | 0.279 | 3.35 | 4.46 | 5.58 |
| ½ | 0.319 | 3.83 | 5.10 | 6.38 |
| 9/16 | 0.359 | 4.31 | 5.74 | 7.18 |
| ⅝ | 0.398 | 4.78 | 6.37 | 7.96 |
| ¾ | 0.478 | 5.74 | 7.65 | 9.56 |
| ⅞ | 0.558 | 6.70 | 8.93 | 11.16 |
| 1 | 0.638 | 7.66 | 10.21 | 12.76 |
| 1⅛ | 0.717 | 8.60 | 11.47 | 14.34 |
| 1¼ | 0.797 | 9.56 | 12.75 | 15.94 |
| 1⅜ | 0.877 | 10.52 | 14.03 | 17.54 |
| 1½ | 0.956 | 11.47 | 15.30 | 19.12 |
| 1¾ | 1.116 | 13.39 | 17.86 | 22.32 |
| 1⅞ | 1.195 | 14.34 | 19.12 | 23.90 |
| 2 | 1.275 | 15.30 | 20.40 | 25.50 |
| 2¼ | 1.434 | 17.21 | 22.94 | 28.68 |
| 2½ | 1.594 | 19.13 | 25.50 | 31.88 |
| 2¾ | 1.753 | 21.04 | 28.05 | 35.06 |
| 3 | 1.913 | 22.96 | 30.61 | 38.26 |
| 3¼ | 2.072 | 24.86 | 33.15 | 41.44 |
| 3½ | 2.231 | 26.77 | 35.70 | 44.62 |
| 3¾ | 2.391 | 28.69 | 38.26 | 47.82 |
| 4 | 2.550 | 30.60 | 40.80 | 51.00 |
| 4½ | 2.869 | 34.43 | 45.90 | 57.38 |
| 5 | 3.188 | 38.26 | 51.01 | 63.76 |
| 6 | 3.825 | 45.90 | 61.20 | 76.50 |
| **7/32x** | | | | |
| 5/16 | 0.232 | 2.78 | 3.71 | 4.64 |
| ⅜ | 0.279 | 3.35 | 4.46 | 5.58 |
| **1/4x** | | | | |
| 5/16 | 0.266 | 3.19 | 4.26 | 5.32 |
| ⅜ | 0.319 | 3.83 | 5.10 | 6.38 |
| 7/16 | 0.372 | 4.46 | 5.95 | 7.44 |
| ½ | 0.425 | 5.10 | 6.80 | 8.50 |

*(Continued)*

# WEIGHT OF FLAT STEEL BARS

In Pounds

| Size in Inches | per Ft. | 12′ Bar | 16′ Bar | 20′ Bar |
|---|---|---|---|---|
| (Continued) | | | | |
| **1/4x** | | | | |
| 9/16 | .478 | 5.74 | 7.65 | 9.56 |
| 5/8 | .531 | 6.37 | 8.50 | 10.62 |
| 11/16 | .584 | 7.01 | 9.34 | 11.68 |
| 3/4 | .638 | 7.66 | 10.21 | 12.76 |
| 13/16 | .691 | 8.29 | 11.06 | 13.82 |
| 7/8 | .744 | 8.93 | 11.90 | 14.88 |
| 15/16 | .797 | 9.56 | 12.75 | 15.94 |
| 1 | .850 | 10.20 | 13.60 | 17.00 |
| 1 1/8 | .956 | 11.47 | 15.30 | 19.12 |
| 1 1/4 | 1.063 | 12.76 | 17.01 | 21.26 |
| 1 3/8 | 1.169 | 14.03 | 18.70 | 23.38 |
| 1 1/2 | 1.275 | 15.30 | 20.40 | 25.50 |
| 1 5/8 | 1.381 | 16.57 | 22.10 | 27.62 |
| 1 3/4 | 1.488 | 17.86 | 23.81 | 29.76 |
| 1 7/8 | 1.594 | 19.13 | 25.50 | 31.88 |
| 2 | 1.700 | 20.40 | 27.20 | 34.00 |
| 2 1/4 | 1.913 | 22.96 | 30.61 | 38.26 |
| 2 1/2 | 2.125 | 25.50 | 34.00 | 42.50 |
| 2 3/4 | 2.338 | 28.06 | 37.41 | 46.76 |
| 3 | 2.550 | 30.60 | 40.80 | 51.00 |
| 3 1/4 | 2.763 | 33.16 | 44.21 | 55.26 |
| 3 1/2 | 2.975 | 35.70 | 47.60 | 59.50 |
| 3 3/4 | 3.188 | 38.26 | 51.01 | 63.76 |
| 4 | 3.400 | 40.80 | 54.40 | 68.00 |
| 4 1/4 | 3.613 | 43.36 | 57.81 | 72.26 |
| 4 1/2 | 3.825 | 45.90 | 61.20 | 76.50 |
| 5 | 4.250 | 51.00 | 68.00 | 85.00 |
| 5 1/2 | 4.675 | 56.10 | 74.80 | 93.50 |
| 6 | 5.100 | 61.20 | 81.60 | 102.00 |
| 7 | 5.950 | 71.40 | 95.20 | 119.00 |
| 8 | 6.800 | 81.60 | 108.80 | 136.00 |
| 10 | 8.500 | 102.00 | 136.00 | 170.00 |
| 12 | 10.200 | 122.40 | 163.20 | 204.00 |
| **5/16x** | | | | |
| 3/8 | .398 | 4.78 | 6.37 | 7.96 |
| 7/16 | .465 | 5.58 | 7.44 | 9.30 |
| 1/2 | .531 | 6.37 | 8.50 | 10.62 |
| 9/16 | .598 | 7.18 | 9.57 | 11.96 |
| 5/8 | .664 | 7.97 | 10.62 | 13.28 |
| 11/16 | .731 | 8.77 | 11.70 | 14.62 |
| 3/4 | .797 | 9.56 | 12.75 | 15.94 |
| 7/8 | .930 | 11.16 | 14.88 | 18.60 |
| 1 | 1.063 | 12.76 | 17.01 | 21.26 |
| 1 1/8 | 1.195 | 14.34 | 19.12 | 23.90 |
| 1 1/4 | 1.328 | 15.94 | 21.25 | 26.56 |
| 1 3/8 | 1.461 | 17.53 | 23.38 | 29.22 |
| 1 1/2 | 1.594 | 19.13 | 25.50 | 31.88 |
| 1 3/4 | 1.859 | 22.31 | 29.74 | 37.18 |
| 2 | 2.125 | 25.50 | 34.00 | 42.50 |
| 2 1/8 | 2.258 | 27.10 | 36.13 | 45.16 |
| 2 1/4 | 2.391 | 28.69 | 38.26 | 47.82 |
| 2 1/2 | 2.656 | 31.87 | 42.50 | 53.12 |
| 2 3/4 | 2.922 | 35.06 | 46.75 | 58.44 |
| 3 | 3.188 | 38.26 | 51.01 | 63.76 |
| 3 1/4 | 3.453 | 41.44 | 55.25 | 69.06 |
| 3 1/2 | 3.719 | 44.63 | 59.50 | 74.38 |
| 4 | 4.250 | 51.00 | 68.00 | 85.00 |
| 4 1/2 | 4.781 | 57.37 | 76.50 | 95.62 |
| 5 | 5.313 | 63.76 | 85.01 | 106.26 |
| 6 | 6.375 | 76.50 | 102.00 | 127.50 |
| 7 | 7.437 | 89.25 | 119.00 | 148.75 |
| 8 | 8.500 | 102.00 | 136.00 | 170.00 |
| 10 | 10.625 | 127.50 | 170.00 | 212.50 |
| 12 | 12.750 | 153.00 | 204.00 | 255.00 |

| Size in Inches | per Ft. | 12′ Bar | 16′ Bar | 20′ Bar |
|---|---|---|---|---|
| **3/8x** | | | | |
| 7/16 | .558 | 6.70 | 8.93 | 11.16 |
| 1/2 | .638 | 7.66 | 10.21 | 12.76 |
| 9/16 | .717 | 8.60 | 11.47 | 14.34 |
| 5/8 | .797 | 9.56 | 12.75 | 15.94 |
| 11/16 | .877 | 10.52 | 14.03 | 17.54 |
| 3/4 | .956 | 11.47 | 15.30 | 19.12 |
| 7/8 | 1.116 | 13.39 | 17.86 | 22.32 |
| 1 | 1.275 | 15.30 | 20.40 | 25.50 |
| 1 1/8 | 1.434 | 17.21 | 22.94 | 28.68 |
| 1 1/4 | 1.594 | 19.13 | 25.50 | 31.88 |
| 1 3/8 | 1.753 | 21.04 | 28.05 | 35.06 |
| 1 1/2 | 1.913 | 22.96 | 30.61 | 38.26 |
| 1 5/8 | 2.072 | 24.86 | 33.15 | 41.44 |
| 1 3/4 | 2.231 | 26.77 | 35.70 | 44.62 |
| 1 7/8 | 2.391 | 28.69 | 38.26 | 47.82 |
| 2 | 2.550 | 30.60 | 40.80 | 51.00 |
| 2 1/4 | 2.869 | 34.43 | 45.90 | 57.38 |
| 2 1/2 | 3.188 | 38.26 | 51.01 | 63.76 |
| 2 3/4 | 3.506 | 42.07 | 56.10 | 70.12 |
| 3 | 3.825 | 45.90 | 61.20 | 76.50 |
| 3 1/4 | 4.144 | 49.73 | 66.30 | 82.88 |
| 3 1/2 | 4.463 | 53.56 | 71.41 | 89.26 |
| 3 3/4 | 4.781 | 57.37 | 76.50 | 95.62 |
| 4 | 5.100 | 61.20 | 81.60 | 102.00 |
| 4 1/4 | 5.419 | 65.03 | 86.70 | 108.38 |
| 4 1/2 | 5.738 | 68.86 | 91.81 | 114.76 |
| 5 | 6.375 | 76.50 | 102.00 | 127.50 |
| 5 1/2 | 7.013 | 84.16 | 112.21 | 140.26 |
| 6 | 7.650 | 91.80 | 122.40 | 153.00 |
| 7 | 8.925 | 107.10 | 142.80 | 178.50 |
| 8 | 10.200 | 122.40 | 163.20 | 204.00 |
| 10 | 12.750 | 153.00 | 204.00 | 255.00 |
| 12 | 15.300 | 183.60 | 244.80 | 306.00 |
| **7/16x** | | | | |
| 1/2 | .744 | 8.93 | 11.90 | 14.88 |
| 9/16 | .837 | 10.04 | 13.39 | 16.74 |
| 5/8 | .930 | 11.16 | 14.88 | 18.60 |
| 3/4 | 1.116 | 13.39 | 17.86 | 22.32 |
| 7/8 | 1.302 | 15.62 | 20.83 | 26.04 |
| 1 | 1.488 | 17.86 | 23.81 | 29.76 |
| 1 1/8 | 1.673 | 20.08 | 26.77 | 33.46 |
| 1 1/4 | 1.859 | 22.31 | 29.74 | 37.18 |
| 1 1/2 | 2.231 | 26.77 | 35.70 | 44.62 |
| 1 3/4 | 2.603 | 31.24 | 41.65 | 52.06 |
| 2 | 2.975 | 35.70 | 47.60 | 59.50 |
| 2 1/4 | 3.347 | 40.16 | 53.55 | 66.94 |
| 2 1/2 | 3.719 | 44.63 | 59.50 | 74.38 |
| 2 3/4 | 4.091 | 49.09 | 65.46 | 81.82 |
| 3 | 4.463 | 53.56 | 71.41 | 89.26 |
| 3 1/4 | 4.834 | 58.01 | 77.34 | 96.68 |
| 3 1/2 | 5.206 | 62.47 | 83.30 | 104.12 |
| 4 | 5.950 | 71.40 | 95.20 | 119.00 |
| 4 1/2 | 6.694 | 80.33 | 107.10 | 133.88 |
| 5 | 7.438 | 89.26 | 119.01 | 148.76 |
| 6 | 8.925 | 107.10 | 142.80 | 178.50 |
| **1/2x** | | | | |
| 9/16 | .956 | 11.47 | 15.30 | 19.12 |
| 5/8 | 1.063 | 12.76 | 17.01 | 21.26 |
| 11/16 | 1.169 | 14.03 | 18.70 | 23.38 |
| 3/4 | 1.275 | 15.30 | 20.40 | 25.50 |
| 13/16 | 1.381 | 16.57 | 22.10 | 27.62 |
| 7/8 | 1.488 | 17.86 | 23.81 | 29.76 |
| 1 | 1.700 | 20.40 | 27.20 | 34.00 |
| 1 1/8 | 1.913 | 22.96 | 30.61 | 38.26 |
| 1 1/4 | 2.125 | 25.50 | 34.00 | 42.50 |
| (Continued) | | | | |

# WEIGHT OF FLAT STEEL BARS

In Pounds

| Size in Inches | per Ft. | 12′ Bar | 16′ Bar | 20′ Bar |
|---|---|---|---|---|
| *(Continued)* | | | | |
| **1/2x** | | | | |
| 1 3/8 | 2.338 | 28.06 | 37.41 | 46.76 |
| 1 1/2 | 2.550 | 30.60 | 40.80 | 51.00 |
| 1 5/8 | 2.763 | 33.16 | 44.21 | 55.26 |
| 1 3/4 | 2.975 | 35.70 | 47.60 | 59.50 |
| 1 7/8 | 3.188 | 38.26 | 51.01 | 63.76 |
| 2 | 3.400 | 40.80 | 54.40 | 68.00 |
| 2 1/4 | 3.825 | 45.90 | 61.20 | 76.50 |
| 2 1/2 | 4.250 | 51.00 | 68.00 | 85.00 |
| 2 3/4 | 4.675 | 56.10 | 74.80 | 93.50 |
| 3 | 5.100 | 61.20 | 81.60 | 102.00 |
| 3 1/4 | 5.525 | 66.30 | 88.40 | 110.50 |
| 3 1/2 | 5.950 | 71.40 | 95.20 | 119.00 |
| 3 3/4 | 6.375 | 76.50 | 102.00 | 127.50 |
| 4 | 6.800 | 81.60 | 108.80 | 136.00 |
| 4 1/4 | 7.225 | 86.70 | 115.60 | 144.50 |
| 4 1/2 | 7.650 | 91.80 | 122.40 | 153.00 |
| 4 3/4 | 8.075 | 96.90 | 129.20 | 161.50 |
| 5 | 8.500 | 102.00 | 136.00 | 170.00 |
| 5 1/4 | 8.925 | 107.10 | 142.80 | 178.50 |
| 5 1/2 | 9.350 | 112.20 | 149.60 | 187.00 |
| 5 3/4 | 9.775 | 117.30 | 156.40 | 195.50 |
| 6 | 10.200 | 122.40 | 163.20 | 204.00 |
| 7 | 11.900 | 142.80 | 190 40 | 238.00 |
| 8 | 13.600 | 163.20 | 217.60 | 272.00 |
| 10 | 17.000 | 204.00 | 272.00 | 340.00 |
| 12 | 20.400 | 244.80 | 326.40 | 408.00 |
| **9/16x** | | | | |
| 5/8 | 1.195 | 14.34 | 19.12 | 23.90 |
| 3/4 | 1.434 | 17.21 | 22.94 | 28.68 |
| 7/8 | 1.673 | 20.08 | 26.77 | 33.46 |
| 1 | 1.913 | 22.96 | 30.61 | 38.26 |
| 1 1/4 | 2.391 | 28.69 | 38.26 | 47.82 |
| 1 1/2 | 2.869 | 34.43 | 45.90 | 57.38 |
| 1 3/4 | 3.347 | 40.16 | 53.55 | 66.94 |
| 2 | 3.825 | 45.90 | 61.20 | 76.50 |
| 2 1/2 | 4.781 | 57.37 | 76.50 | 95.62 |
| 3 | 5.738 | 68.86 | 91.81 | 114.76 |
| **5/8x** | | | | |
| 1 1/16 | 1.461 | 17.53 | 23.38 | 29.22 |
| 3/4 | 1.594 | 19.13 | 25.50 | 31.88 |
| 1 3/16 | 1.727 | 20.72 | 27.63 | 34.54 |
| 7/8 | 1.859 | 22.31 | 29.74 | 37.18 |
| 1 | 2.125 | 25.50 | 34.00 | 42.50 |
| 1 1/8 | 2.391 | 28.69 | 38.26 | 47.82 |
| 1 1/4 | 2.656 | 31.87 | 42.50 | 53.12 |
| 1 3/8 | 2.922 | 35.06 | 46.75 | 58.44 |
| 1 1/2 | 3.188 | 38.26 | 51.01 | 63.76 |
| 1 5/8 | 3.453 | 41.44 | 55.25 | 69.06 |
| 1 3/4 | 3.719 | 44.63 | 59.50 | 74.38 |
| 1 7/8 | 3.984 | 47.81 | 63.74 | 79.68 |
| 2 | 4.250 | 51.00 | 68.00 | 85.00 |
| 2 1/4 | 4.781 | 57.37 | 76.50 | 95.62 |
| 2 1/2 | 5.313 | 63.76 | 85.01 | 106.26 |
| 2 3/4 | 5.844 | 70.13 | 93.50 | 116.88 |
| 3 | 6.375 | 76.50 | 102.00 | 127.50 |
| 3 1/4 | 6.906 | 82.87 | 110.50 | 138.12 |
| 3 1/2 | 7.438 | 89.26 | 119.01 | 148.76 |
| 3 3/4 | 7.969 | 95.63 | 127.50 | 159.38 |
| 4 | 8.500 | 102.00 | 136.00 | 170.00 |
| 4 1/4 | 9.031 | 108.37 | 144.50 | 180.62 |
| 4 1/2 | 9.563 | 114.76 | 153.01 | 191.26 |
| 4 3/4 | 10.094 | 121.13 | 161.50 | 201.88 |
| 5 | 10.625 | 127.50 | 170.00 | 212.50 |
| 5 1/2 | 11.688 | 140.26 | 187.01 | 233.76 |
| **5/8x** | | | | |
| 6 | 12.750 | 153.00 | 204.00 | 255.00 |
| 7 | 14.875 | 178.50 | 238.00 | 297.50 |
| 8 | 17.000 | 204.00 | 272.00 | 340.00 |
| 10 | 21.250 | 255.00 | 340.00 | 425.00 |
| 12 | 25.500 | 306.00 | 408.00 | 510.00 |
| **11/16x** | | | | |
| 3/4 | 1.753 | 21.04 | 28.05 | 35.06 |
| 13/16 | 1.899 | 22.79 | 30.38 | 37.98 |
| 7/8 | 2.045 | 24.54 | 32.72 | 40.90 |
| 1 | 2.338 | 28.06 | 37.41 | 46.76 |
| 1 1/8 | 2.630 | 31.56 | 42.08 | 52.60 |
| 1 1/4 | 2.922 | 35.06 | 46.75 | 58.44 |
| 1 1/2 | 3.506 | 42.07 | 56.10 | 70.12 |
| 1 3/4 | 4.091 | 49.09 | 65.46 | 81.82 |
| 2 | 4.675 | 56.10 | 74.80 | 93.50 |
| **3/4x** | | | | |
| 13/16 | 2.072 | 24.86 | 33.15 | 41.44 |
| 7/8 | 2.231 | 26.77 | 35.70 | 44.62 |
| 1 | 2.550 | 30.60 | 40.80 | 51.00 |
| 1 1/8 | 2.869 | 34.43 | 45.90 | 57.38 |
| 1 1/4 | 3.188 | 38.26 | 51.01 | 63.76 |
| 1 3/8 | 3.506 | 42.07 | 56.10 | 70.12 |
| 1 1/2 | 3.825 | 45.90 | 61.20 | 76.50 |
| 1 5/8 | 4.144 | 49.73 | 66.30 | 82.88 |
| 1 3/4 | 4.463 | 53.56 | 71.41 | 89.26 |
| 2 | 5.100 | 61.20 | 81.60 | 102.00 |
| 2 1/4 | 5.738 | 68.86 | 91.81 | 114.76 |
| 2 1/2 | 6.375 | 76.50 | 102.00 | 127.50 |
| 2 3/4 | 7.013 | 84.16 | 112.21 | 140.26 |
| 3 | 7.650 | 91.80 | 122.40 | 153.00 |
| 3 1/4 | 8.288 | 99.46 | 132.61 | 165.76 |
| 3 1/2 | 8.925 | 107.10 | 142.80 | 178.50 |
| 4 | 10.200 | 122.40 | 163.20 | 204.00 |
| 4 1/2 | 11.475 | 137.70 | 183.60 | 229.50 |
| 5 | 12.750 | 153.00 | 204.00 | 255.00 |
| 5 1/2 | 14.025 | 168.30 | 224.40 | 280.50 |
| 6 | 15.300 | 183.60 | 244.80 | 306.00 |
| 7 | 17.850 | 214.20 | 285.60 | 357.00 |
| 8 | 20.400 | 244.80 | 326.40 | 408.00 |
| 10 | 25.500 | 306.00 | 408.00 | 510.00 |
| 12 | 30.600 | 367.20 | 489.60 | 612.00 |
| **7/8x** | | | | |
| 1 | 2.975 | 35.70 | 47.60 | 59.50 |
| 1 1/8 | 3.347 | 40.16 | 53.55 | 66.94 |
| 1 1/4 | 3.719 | 44.63 | 59.50 | 74.38 |
| 1 3/8 | 4.091 | 49.09 | 65.46 | 81.82 |
| 1 1/2 | 4.463 | 53.56 | 71.41 | 89.26 |
| 1 3/4 | 5.206 | 62.47 | 83.30 | 104.12 |
| 2 | 5.950 | 71.40 | 95.20 | 119.00 |
| 2 1/4 | 6.694 | 80.33 | 107.10 | 133.88 |
| 2 1/2 | 7.438 | 89.26 | 119.01 | 148.76 |
| 2 3/4 | 8.181 | 98.17 | 130.90 | 163.62 |
| 3 | 8.925 | 107.10 | 142.80 | 178.50 |
| 3 1/4 | 9.669 | 116.03 | 154.70 | 193.38 |
| 3 1/2 | 10.413 | 124.96 | 166.61 | 208.26 |
| 4 | 11.900 | 142.80 | 190.40 | 238.00 |
| 4 1/2 | 13.388 | 160.66 | 214.21 | 267.76 |
| 5 | 14.875 | 178.50 | 238.00 | 297.50 |
| 6 | 17.850 | 214.20 | 285.60 | 357.00 |
| 7 | 20.825 | 249.90 | 333.20 | 416 50 |
| 8 | 23.800 | 285.60 | 380.80 | 476.00 |
| 10 | 29.750 | 357.00 | 476.00 | 595.00 |
| 12 | 35.700 | 428.40 | 571.20 | 714.00 |
| *(Continued)* | | | | |

# WEIGHT OF FLAT STEEL BARS

In Pounds

| Size in Inches | per Ft. | 12′ Bar | 16′ Bar | 20′ Bar |
|---|---|---|---|---|
| (Continued) | | | | |
| **1x** | | | | |
| 1 ⅛ | 3.825 | 45.90 | 61.20 | 76.50 |
| 1 ¼ | 4.250 | 51.00 | 68.00 | 85.00 |
| 1 ⅜ | 4.675 | 56.10 | 74.80 | 93.50 |
| 1 ½ | 5.100 | 61.20 | 81.60 | 102.00 |
| 1 ⅝ | 5.525 | 66.30 | 88.40 | 110.50 |
| 1 ¾ | 5.950 | 71.40 | 95.20 | 119.00 |
| 2 | 6.800 | 81.60 | 108.80 | 136.00 |
| 2 ¼ | 7.650 | 91.80 | 122.40 | 153.00 |
| 2 ½ | 8.500 | 102.00 | 136.00 | 170.00 |
| 2 ¾ | 9.350 | 112.20 | 149.60 | 187.00 |
| 3 | 10.200 | 122.40 | 163.20 | 204.00 |
| 3 ¼ | 11.050 | 132.60 | 176.80 | 221.00 |
| 3 ½ | 11.900 | 142.80 | 190.40 | 238.00 |
| 3 ¾ | 12.750 | 153.00 | 204.00 | 255.00 |
| 4 | 13.600 | 163.20 | 217.60 | 272.00 |
| 4 ½ | 15.300 | 183.60 | 244.80 | 306.00 |
| 5 | 17.000 | 204.00 | 272.00 | 340.00 |
| 5 ½ | 18.700 | 224.40 | 299.20 | 374.00 |
| 6 | 20.400 | 244.80 | 326.40 | 408.00 |
| 7 | 23.800 | 285 60 | 380.80 | 476.00 |
| 8 | 27.200 | 326.40 | 435.20 | 544.00 |
| 10 | 34.000 | 408.00 | 544.00 | 680.00 |
| 12 | 40.800 | 489.60 | 652.80 | 816.00 |
| **1⅛x** | | | | |
| 1 ¼ | 4.781 | 57.37 | 76.50 | 95.62 |
| 1 ⅜ | 5.259 | 63.11 | 84.14 | 105.18 |
| 1 ½ | 5.738 | 68.86 | 91.81 | 114.76 |
| 1 ⅝ | 6.216 | 74.59 | 99.46 | 124.32 |
| 1 ¾ | 6.694 | 80.33 | 107.10 | 133.88 |
| 2 | 7.650 | 91.80 | 122.40 | 153.00 |
| 2 ¼ | 8.606 | 103.27 | 137.70 | 172.12 |
| 2 ½ | 9.563 | 114.76 | 153.01 | 191.26 |
| 3 | 11.475 | 137.70 | 183.60 | 229.50 |
| 4 | 15.300 | 183.60 | 244.80 | 306.00 |
| **1¼x** | | | | |
| 1 ⅜ | 5.844 | 70.13 | 93.50 | 116.88 |
| 1 ½ | 6.375 | 76.50 | 102.00 | 127.50 |
| 1 ⅝ | 6.906 | 82.87 | 110.50 | 138.12 |
| 1 ¾ | 7.438 | 89.26 | 119.01 | 148.76 |
| 1 ⅞ | 7.969 | 95.63 | 127.50 | 159.38 |
| 2 | 8.500 | 102.00 | 136.00 | 170.00 |
| 2 ¼ | 9.563 | 114.76 | 153.01 | 191.26 |
| 2 ½ | 10.625 | 127.50 | 170.00 | 212.50 |
| 2 ¾ | 11.688 | 140.26 | 187.01 | 233.76 |
| 3 | 12.750 | 153.00 | 204.00 | 255.00 |
| 3 ¼ | 13.813 | 165.76 | 221.01 | 276.26 |
| 3 ½ | 14.875 | 178.50 | 238.00 | 297.50 |
| 4 | 17.000 | 204.00 | 272.00 | 340.00 |
| 4 ½ | 19.125 | 229.50 | 306.00 | 382.50 |
| 5 | 21.250 | 255.00 | 340.00 | 425.00 |
| 5 ½ | 23.375 | 280.50 | 374.00 | 467.50 |
| 6 | 25.500 | 306.00 | 408.00 | 510.00 |
| 7 | 29.750 | 357.00 | 476 00 | 595 00 |
| 8 | 34.000 | 408.00 | 544.00 | 680.00 |
| 10 | 42.500 | 510.00 | 680.00 | 850.00 |
| 12 | 51.000 | 612.00 | 816.00 | 1020.00 |
| **1⅜x** | | | | |
| 2 | 9.35 | 112.20 | 149.60 | 187.00 |
| 3 | 14.03 | 168.36 | 224.48 | 280.60 |
| **1½x** | | | | |
| 1 ⅝ | 8.29 | 99.48 | 132.64 | 165.80 |
| 1 ¾ | 8.93 | 107.16 | 142.88 | 178.60 |
| 2 | 10.20 | 122.40 | 163.20 | 204.00 |
| 2 ¼ | 11.48 | 137.76 | 183.68 | 229.60 |
| 2 ½ | 12.75 | 153.00 | 204.00 | 255.00 |
| **1½x** | | | | |
| 2 ¾ | 14.03 | 168.36 | 224.48 | 280.60 |
| 3 | 15.30 | 183.60 | 244.80 | 306.00 |
| 3 ¼ | 16.58 | 198.96 | 265.28 | 331.60 |
| 3 ½ | 17.85 | 214.20 | 285.60 | 357.00 |
| 4 | 20.40 | 244.80 | 326.40 | 408.00 |
| 4 ½ | 22.95 | 275.40 | 367.20 | 459.00 |
| 5 | 25.50 | 306.00 | 408.00 | 510.00 |
| 5 ½ | 28.05 | 336.60 | 448.80 | 561.00 |
| 6 | 30.60 | 367.20 | 489.60 | 612.00 |
| 7 | 35.70 | 428.40 | 571.20 | 714.00 |
| 8 | 40.80 | 489.60 | 652.80 | 816.00 |
| 10 | 51.00 | 612.00 | 816.00 | 1020.00 |
| 12 | 61.20 | 734.40 | 979.20 | 1224.00 |
| **1¾x** | | | | |
| 2 | 11.90 | 142.80 | 190.40 | 238.00 |
| 2 ¼ | 13.39 | 160.68 | 214.24 | 267.80 |
| 2 ½ | 14.88 | 178.56 | 238.08 | 297.60 |
| 2 ¾ | 16.36 | 196.32 | 261.76 | 327.20 |
| 3 | 17.85 | 214.20 | 285.60 | 357.00 |
| 3 ¼ | 19.34 | 232.08 | 309.44 | 386.80 |
| 3 ½ | 20.83 | 249.96 | 333.28 | 416.60 |
| 4 | 23.80 | 285.60 | 380.80 | 476.00 |
| 4 ½ | 26.78 | 321.36 | 428.48 | 535.60 |
| 5 | 29.75 | 357.00 | 476.00 | 595.00 |
| 5 ½ | 32.73 | 392.76 | 523.68 | 654.60 |
| 6 | 35.70 | 428.40 | 571.20 | 714.00 |
| **2x** | | | | |
| 2 ¼ | 15.30 | 183.60 | 244.80 | 306.00 |
| 2 ½ | 17.00 | 204.00 | 272.00 | 340.00 |
| 2 ¾ | 18.70 | 224.40 | 299.20 | 374.00 |
| 3 | 20.40 | 244.80 | 326.40 | 408.00 |
| 3 ¼ | 22.10 | 265.20 | 353.60 | 442.00 |
| 3 ½ | 23.80 | 285.60 | 380.80 | 476.00 |
| 4 | 27.20 | 326.40 | 435.20 | 544.00 |
| 4 ½ | 30.60 | 367.20 | 489.60 | 612.00 |
| 5 | 34.00 | 408.00 | 544.00 | 680.00 |
| 6 | 40.80 | 489.60 | 652.80 | 816.00 |
| 7 | 47.60 | 571.20 | 761.60 | 952.00 |
| 8 | 54.40 | 652.80 | 870.40 | 1088.00 |
| 10 | 68.00 | 816.00 | 1088.00 | 1360.00 |
| 12 | 81.60 | 979.20 | 1305.60 | 1632.00 |
| **2¼x** | | | | |
| 2 ½ | 19.13 | 229.56 | 306.08 | 382.60 |
| 2 ¾ | 21.04 | 252.48 | 336.64 | 420.80 |
| 3 | 22.95 | 275.40 | 367.20 | 459.00 |
| 3 ¼ | 24.86 | 298.32 | 397.76 | 497.20 |
| 3 ½ | 26.78 | 321.36 | 428.48 | 535.60 |
| 4 | 30.60 | 367.20 | 489.60 | 612.00 |
| 4 ½ | 34.43 | 413.16 | 550.80 | 688.60 |
| 5 | 38.25 | 459.00 | 612.00 | 765.00 |
| 6 | 45.90 | 550.80 | 734.40 | 918.00 |
| **2½x** | | | | |
| 2 ¾ | 23.38 | 280.56 | 374.08 | 467.60 |
| 3 | 25.50 | 306.00 | 408.00 | 510.00 |
| 3 ¼ | 27.63 | 331.56 | 442.08 | 552.60 |
| 3 ½ | 29.75 | 357.00 | 476.00 | 595.00 |
| 4 | 34.00 | 408.00 | 544.00 | 680.00 |
| 4 ½ | 38.25 | 459.00 | 612.00 | 765.00 |
| 5 | 42.50 | 510.00 | 680.00 | 850.00 |
| 6 | 51.00 | 612.00 | 816.00 | 1020.00 |
| **3x** | | | | |
| 4 | 40.80 | 489.60 | 652.80 | 816.00 |
| 5 | 51.00 | 612.00 | 816.00 | 1020.00 |
| 6 | 61.20 | 734.40 | 979.20 | 1224.00 |
| **4x** | | | | |
| 6 | 81.60 | 979.20 | 1305.60 | 1632.00 |

# WEIGHT OF STEEL PLATES

## CARBON STEEL PLATES

(Theoretical Weight)

| Size in Inches | Weight per Square Foot in Lbs. | Size in Inches | Weight per Square Foot in Lbs. |
|---|---|---|---|
| 3/16 | 7.65 | 2 1/2 | 102.00 |
| 1/4 | 10.20 | 2 3/4 | 112.20 |
| 5/16 | 12.75 | 3 | 122.40 |
| 3/8 | 15.30 | 3 1/4 | 132.60 |
| 7/16 | 17.85 | 3 1/2 | 142.80 |
| 1/2 | 20.40 | 3 3/4 | 153.00 |
| 9/16 | 22.95 | 4 | 163.20 |
| 5/8 | 25.50 | 4 1/4 | 173.40 |
| 3/4 | 30.60 | 4 1/2 | 183.60 |
| 7/8 | 35.70 | 5 | 204.00 |
| 1 | 40.80 | 5 1/2 | 224.40 |
| 1 1/8 | 45.90 | 6 | 244.80 |
| 1 1/4 | 51.00 | 6 1/2 | 265.20 |
| 1 3/8 | 56.10 | 7 | 285.60 |
| 1 1/2 | 61.20 | 7 1/2 | 306.00 |
| 1 5/8 | 66.30 | 8 | 326.40 |
| 1 3/4 | 71.40 | 9 | 367.20 |
| 2 | 81.60 | 10 | 408.00 |
| 2 1/4 | 91.80 | | |

## STAINLESS STEEL PLATES

(Average Weight)

| Size in Inches | Stock or Cut Widths | | Size in Inches | Stock or Cut Widths | |
|---|---|---|---|---|---|
| | 80 Inches & Under | Over 80 Inches | | 80 Inches & Under | Over 80 Inches |
| 3/16 | 8.295 | 8.566 | 1 1/8 | 47.905 | 48.603 |
| 1/4 | 10.956 | 11.266 | 1 3/16 | 50.567 | 51.303 |
| 5/16 | 13.437 | 13.695 | 1 1/4 | 53.228 | 54.004 |
| 3/8 | 16.123 | 16.433 | 1 5/16 | 55.890 | 56.704 |
| 7/16 | 18.810 | 19.172 | 1 3/8 | 58.550 | 59.403 |
| 1/2 | 21.498 | 21.911 | 1 7/16 | 61.212 | 62.103 |
| 9/16 | 24.185 | 24.650 | 1 1/2 | 63.873 | 64.804 |
| 5/8 | 26.614 | 27.002 | 1 9/16 | 66.535 | 67.504 |
| 11/16 | 29.276 | 29.702 | 1 5/8 | 69.196 | 70.204 |
| 3/4 | 31.937 | 32.402 | 1 11/16 | 71.858 | 72.904 |
| 13/16 | 34.599 | 35.103 | 1 3/4 | 74.519 | 75.605 |
| 7/8 | 37.260 | 37.803 | 1 13/16 | 77.181 | 78.305 |
| 15/16 | 39.922 | 40.503 | 1 7/8 | 79.843 | 81.005 |
| 1 | 42.582 | 43.202 | 1 13/16 | 82.504 | 83.706 |
| 1 1/16 | 45.244 | 45.903 | 2 | 85.164 | 86.405 |

## APPROXIMATE WEIGHT OF VARIOUS METALS

To find the weight of various metals, multiply the contents in cubic inches by the number shown below. The result will be the approximate weight in pounds.

| | | | |
|---|---|---|---|
| Iron | .27777 | Brass | .3112 |
| Steel | .28332 | Lead | .41015 |
| Copper | .32118 | Zinc | .25318 |
| Tin | .26562 | Aluminum | .09375 |

# WEIGHT OF CARBON STEEL CIRCLES

**(Theoretical)**

In Pounds

| Dia., In. | Thickness in Inches | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1/8 | 3/16 | 1/4 | 5/16 | 3/8 | 7/16 | 1/2 | 9/16 | 5/8 | 11/16 | 3/4 | 13/16 | 7/8 | 1 |
| 1 | .028 | .042 | .056 | .069 | .083 | .097 | .111 | .125 | .139 | .153 | .167 | .181 | .195 | .223 |
| 2 | .111 | .166 | .222 | .278 | .333 | .389 | .444 | .502 | .557 | .612 | .668 | .724 | .779 | .892 |
| 3 | .249 | .375 | .500 | .626 | .749 | .874 | .999 | 1.13 | 1.25 | 1.37 | 1.50 | 1.63 | 1.75 | 2.01 |
| 4 | .444 | .666 | .888 | 1.11 | 1.33 | 1.55 | 1.78 | 2.01 | 2.23 | 2.45 | 2.67 | 2.90 | 3.12 | 3.57 |
| 5 | .693 | 1.04 | 1.388 | 1.74 | 2.08 | 2.43 | 2.78 | 3.14 | 3.48 | 3.89 | 4.18 | 4.52 | 4.87 | 5.58 |
| 6 | .998 | 1.50 | 2.00 | 2.51 | 3.00 | 3.50 | 4.00 | 4.52 | 5.01 | 5.51 | 6.01 | 6.51 | 7.01 | 8.30 |
| 7 | 1.36 | 2.04 | 2.72 | 3.41 | 4.08 | 4.76 | 5.44 | 6.15 | 6.82 | 7.50 | 8.19 | 8.87 | 9.55 | 10.93 |
| 8 | 1.77 | 2.66 | 3.55 | 4.45 | 5.33 | 6.22 | 7.11 | 8.03 | 8.91 | 9.80 | 10.69 | 11.58 | 12.47 | 14.28 |
| 9 | 2.25 | 3.37 | 4.50 | 5.69 | 6.74 | 7.87 | 9.00 | 10.16 | 11.28 | 12.41 | 13.53 | 14.66 | 15.78 | 18.07 |
| 10 | 2.77 | 4.16 | 5.55 | 6.96 | 8.33 | 9.72 | 11.11 | 12.54 | 13.93 | 15.36 | 16.71 | 18.10 | 19.49 | 22.31 |
| 11 | 3.35 | 5.04 | 6.72 | 8.42 | 10.07 | 11.76 | 13.44 | 15.18 | 16.85 | 18.53 | 20.21 | 21.90 | 23.58 | 26.99 |
| 12 | 3.99 | 5.99 | 8.00 | 10.02 | 11.99 | 13.99 | 15.99 | 18.06 | 20.05 | 22.05 | 24.06 | 26.06 | 28.06 | 32.12 |
| 13 | 4.69 | 7.03 | 9.38 | 11.76 | 14.07 | 16.42 | 18.77 | 21.11 | 23.53 | 25.88 | 28.23 | 30.58 | 32.93 | 37.70 |
| 14 | 5.43 | 8.16 | 10.88 | 13.64 | 16.32 | 19.04 | 21.77 | 24.58 | 26.29 | 30.02 | 32.74 | 35.47 | 38.19 | 43.72 |
| 15 | 6.24 | 9.37 | 12.49 | 15.66 | 18.73 | 21.86 | 24.99 | 28.22 | 31.33 | 33.46 | 37.59 | 40.71 | 43.84 | 50.19 |
| 16 | 7 | 11 | 15 | 18 | 22 | 25 | 29 | 32 | 35 | 39 | 42 | 46 | 49 | 56 |
| 17 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 48 | 52 | 56 | 64 |
| 18 | 9 | 14 | 18 | 23 | 27 | 32 | 36 | 40 | 45 | 49 | 54 | 58 | 63 | 71 |
| 19 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 80 |
| 20 | 11 | 17 | 23 | 28 | 34 | 39 | 45 | 50 | 55 | 61 | 66 | 72 | 77 | 88 |
| 21 | 12 | 19 | 25 | 31 | 37 | 43 | 49 | 55 | 61 | 67 | 73 | 79 | 85 | 97 |
| 22 | 14 | 20 | 27 | 34 | 41 | 47 | 54 | 60 | 67 | 73 | 80 | 87 | 93 | 107 |
| 23 | 15 | 22 | 30 | 37 | 44 | 52 | 59 | 66 | 73 | 80 | 88 | 95 | 102 | 117 |
| 24 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 71 | 79 | 87 | 95 | 103 | 111 | 127 |
| 25 | 18 | 26 | 35 | 44 | 53 | 61 | 70 | 78 | 86 | 95 | 103 | 112 | 121 | 138 |
| 26 | 19 | 28 | 38 | 47 | 56 | 66 | 75 | 84 | 93 | 103 | 112 | 121 | 131 | 149 |
| 27 | 20 | 30 | 41 | 51 | 61 | 71 | 81 | 91 | 101 | 111 | 121 | 131 | 141 | 161 |
| 28 | 22 | 33 | 44 | 55 | 65 | 76 | 87 | 97 | 108 | 119 | 130 | 141 | 152 | 173 |
| 29 | 24 | 35 | 47 | 59 | 71 | 82 | 94 | 104 | 116 | 127 | 139 | 151 | 163 | 186 |
| 30 | 25 | 38 | 50 | 63 | 75 | 88 | 100 | 112 | 124 | 137 | 149 | 162 | 174 | 199 |
| 31 | 27 | 40 | 54 | 67 | 80 | 94 | 107 | 119 | 133 | 146 | 159 | 173 | 186 | 212 |
| 32 | 29 | 43 | 57 | 71 | 86 | 100 | 114 | 127 | 141 | 156 | 170 | 184 | 198 | 226 |
| 33 | 30 | 45 | 61 | 76 | 91 | 106 | 121 | 135 | 150 | 165 | 180 | 196 | 211 | 241 |
| 34 | 32 | 48 | 65 | 81 | 97 | 113 | 129 | 144 | 160 | 176 | 192 | 208 | 224 | 255 |
| 35 | 34 | 51 | 68 | 85 | 102 | 119 | 136 | 152 | 169 | 186 | 203 | 220 | 237 | 271 |
| 36 | 36 | 54 | 72 | 90 | 108 | 126 | 144 | 162 | 180 | 198 | 216 | 234 | 252 | 288 |
| 37 | 38 | 57 | 76 | 95 | 115 | 134 | 153 | 172 | 191 | 210 | 229 | 248 | 267 | 306 |
| 38 | 40 | 60 | 80 | 100 | 121 | 141 | 161 | 181 | 201 | 221 | 241 | 261 | 281 | 322 |
| 39 | 42 | 64 | 85 | 106 | 127 | 148 | 169 | 190 | 212 | 233 | 254 | 275 | 296 | 338 |
| 40 | 45 | 67 | 89 | 111 | 134 | 156 | 178 | 200 | 223 | 245 | 267 | 289 | 312 | 356 |
| 41 | 47 | 70 | 94 | 117 | 141 | 164 | 187 | 211 | 234 | 258 | 281 | 304 | 327 | 374 |
| 42 | 49 | 74 | 98 | 123 | 148 | 172 | 197 | 221 | 246 | 270 | 295 | 319 | 344 | 394 |
| 43 | 52 | 77 | 103 | 129 | 155 | 180 | 206 | 232 | 258 | 283 | 309 | 335 | 360 | 412 |
| 44 | 54 | 81 | 108 | 135 | 162 | 188 | 215 | 242 | 269 | 296 | 323 | 350 | 377 | 430 |
| 45 | 56 | 85 | 113 | 141 | 169 | 197 | 225 | 253 | 282 | 310 | 338 | 366 | 394 | 450 |
| 46 | 59 | 88 | 118 | 147 | 177 | 206 | 235 | 265 | 294 | 324 | 353 | 383 | 412 | 475 |
| 47 | 62 | 92 | 123 | 154 | 185 | 215 | 246 | 277 | 308 | 338 | 369 | 399 | 430 | 492 |
| 48 | 64 | 96 | 128 | 160 | 193 | 225 | 257 | 289 | 321 | 353 | 385 | 417 | 449 | 514 |
| 49 | 67 | 100 | 134 | 167 | 201 | 234 | 267 | 301 | 334 | 367 | 401 | 434 | 467 | 534 |
| 50 | 70 | 105 | 139 | 174 | 209 | 244 | 279 | 313 | 348 | 383 | 418 | 452 | 487 | 558 |
| 51 | ... | 109 | 145 | 181 | 217 | 253 | 289 | 325 | 362 | 398 | 434 | 470 | 506 | 578 |
| 52 | ... | 113 | 151 | 188 | 226 | 263 | 301 | 339 | 376 | 414 | 452 | 489 | 527 | 602 |
| 53 | ... | 117 | 156 | 195 | 235 | 273 | 313 | 352 | 391 | 430 | 469 | 508 | 547 | 626 |
| 54 | ... | 122 | 162 | 203 | 244 | 284 | 325 | 365 | 406 | 446 | 487 | 527 | 568 | 650 |
| 55 | ... | 126 | 168 | 210 | 253 | 295 | 337 | 379 | 421 | 463 | 505 | 547 | 589 | 674 |
| 56 | ... | 131 | 175 | 218 | 262 | 305 | 349 | 393 | 436 | 480 | 524 | 567 | 610 | 698 |
| 57 | ... | 136 | 181 | 226 | 272 | 317 | 362 | 407 | 453 | 498 | 543 | 587 | 633 | 724 |
| 58 | ... | 141 | 187 | 234 | 281 | 328 | 375 | 421 | 468 | 515 | 562 | 609 | 655 | 750 |
| 59 | ... | 145 | 194 | 242 | 291 | 339 | 387 | 436 | 484 | 533 | 581 | 629 | 678 | 774 |
| 60 | ... | 150 | 200 | 250 | 301 | 351 | 401 | 451 | 501 | 551 | 601 | 651 | 701 | 802 |
| 61 | ... | 155 | 207 | 259 | 311 | 362 | 414 | 466 | 518 | 569 | 621 | 673 | 724 | 828 |
| 62 | ... | 161 | 214 | 268 | 321 | 375 | 428 | 482 | 535 | 589 | 642 | 695 | 749 | 856 |
| 63 | ... | 166 | 221 | 276 | 332 | 387 | 442 | 497 | 553 | 608 | 663 | 718 | 774 | 884 |
| 64 | ... | 171 | 228 | 285 | 342 | 399 | 456 | 513 | 570 | 627 | 684 | 741 | 798 | 912 |
| 65 | ... | 177 | 235 | 294 | 353 | 412 | 471 | 529 | 588 | 647 | 706 | 764 | 823 | 942 |
| 66 | ... | 182 | 243 | 303 | 364 | 425 | 485 | 546 | 607 | 667 | 728 | 788 | 848 | 970 |
| 67 | ... | 188 | 250 | 313 | 375 | 438 | 500 | 563 | 625 | 688 | 750 | 812 | 874 | 1000 |
| 68 | ... | 193 | 257 | 322 | 386 | 450 | 515 | 579 | 643 | 708 | 772 | 836 | 900 | 1030 |
| 69 | ... | 199 | 265 | 331 | 398 | 464 | 530 | 596 | 663 | 729 | 795 | 861 | 927 | 1060 |
| 70 | ... | 205 | 273 | 341 | 409 | 477 | 545 | 613 | 682 | 750 | 818 | 886 | 954 | 1090 |
| 71 | ... | 211 | 281 | 351 | 421 | 491 | 561 | 631 | 702 | 772 | 842 | 912 | 982 | 1122 |
| 72 | ... | 217 | 289 | 361 | 433 | 505 | 577 | 649 | 722 | 794 | 866 | 937 | 1009 | 1154 |
| 73 | ... | 223 | 297 | 371 | 445 | 519 | 593 | 667 | 742 | 816 | 890 | 964 | 1038 | 1186 |
| 74 | ... | 226 | 305 | 381 | 458 | 534 | 610 | 686 | 763 | 839 | 915 | 990 | 1066 | 1220 |
| 75 | ... | 235 | 313 | 391 | 470 | 548 | 626 | 704 | 783 | 861 | 939 | 1017 | 1095 | 1252 |

(Continued)

For approximate stainless steel circle weights multiply the carbon circle weight in the desired size by the following percentages:

*Straight Chrome* . . . . . *99.21*

*Chrome-Nickel* . . . . . *101.33*

# WEIGHT OF CARBON STEEL CIRCLES

## (Theoretical)

In Pounds

| Dia. in Inches | Thickness in Inches | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1/4 | 5/16 | 3/8 | 7/16 | 1/2 | 9/16 | 5/8 | 11/16 | 3/4 | 13/16 | 7/8 | 15/16 | 1 |
| | (Continued) | | | | | | | | | | | | |
| 76 | 322 | 402 | 482 | 563 | 643 | 723 | 804 | 884 | 964 | 1045 | 1125 | .... | 1286 |
| 77 | 330 | 413 | 495 | 578 | 660 | 743 | 825 | 908 | 990 | 1073 | 1155 | .... | 1320 |
| 78 | 339 | 423 | 508 | 593 | 678 | 762 | 847 | 932 | 1016 | 1101 | 1186 | .... | 1356 |
| 79 | 348 | 434 | 521 | 608 | 695 | 782 | 869 | 956 | 1043 | 1129 | 1216 | .... | 1390 |
| 80 | 356 | 445 | 534 | 623 | 713 | 802 | 891 | 980 | 1069 | 1158 | 1247 | .... | 1426 |
| 81 | 365 | 457 | 548 | 639 | 731 | 822 | 913 | 1004 | 1096 | 1187 | 1278 | .... | 1462 |
| 82 | 374 | 468 | 561 | 655 | 749 | 842 | 936 | 1029 | 1123 | 1217 | 1310 | .... | 1498 |
| 83 | 384 | 479 | 575 | 671 | 767 | 863 | 959 | 1055 | 1151 | 1246 | 1342 | .... | 1534 |
| 84 | 393 | 491 | 589 | 687 | 786 | 884 | 982 | 1080 | 1179 | 1277 | 1375 | .... | 1572 |
| 85 | 402 | 503 | 603 | 704 | 805 | 905 | 1006 | 1106 | 1207 | 1307 | 1408 | .... | 1610 |
| 86 | 412 | 515 | 618 | 721 | 824 | 926 | 1029 | 1132 | 1235 | 1338 | 1441 | .... | 1648 |
| 87 | 422 | 527 | 632 | 738 | 843 | 948 | 1054 | 1159 | 1265 | 1370 | 1475 | .... | 1686 |
| 88 | 431 | 539 | 647 | 755 | 863 | 970 | 1078 | 1186 | 1294 | 1402 | 1509 | .... | 1726 |
| 89 | 441 | 551 | 661 | 771 | 882 | 992 | 1102 | 1212 | 1323 | 1433 | 1543 | .... | 1764 |
| 90 | 451 | 564 | 677 | 789 | 902 | 1015 | 1128 | 1240 | 1353 | 1466 | 1579 | .... | 1804 |
| 91 | 461 | 576 | 692 | 807 | 922 | 1037 | 1153 | 1268 | 1383 | 1495 | 1614 | .... | 1844 |
| 92 | 471 | 589 | 707 | 825 | 943 | 1060 | 1178 | 1296 | 1414 | 1532 | 1649 | .... | 1886 |
| 93 | 482 | 602 | 722 | 843 | 963 | 1084 | 1204 | 1324 | 1445 | 1565 | 1686 | .... | 1926 |
| 94 | 492 | 615 | 738 | 861 | 984 | 1107 | 1230 | 1353 | 1476 | 1599 | 1722 | .... | 1968 |
| 95 | 503 | 628 | 754 | 879 | 1005 | 1131 | 1256 | 1382 | 1507 | 1633 | 1759 | .... | 2010 |
| 96 | 513 | 641 | 769 | 897 | 1026 | 1154 | 1282 | 1410 | 1538 | 1666 | 1795 | .... | .. |
| 97 | 524 | 654 | 785 | 916 | 1047 | 1178 | 1309 | 1440 | 1570 | 1701 | 1832 | .... | .... |
| 98 | 535 | 668 | 801 | 935 | 1069 | 1202 | 1336 | 1469 | 1603 | 1737 | 1870 | .... | .... |
| 99 | 546 | 682 | 818 | 954 | 1091 | 1227 | 1363 | 1500 | 1636 | 1772 | 1908 | .... | .... |
| 100 | 557 | 696 | 835 | 974 | 1113 | 1252 | 1391 | 1530 | 1669 | 1809 | 1948 | .... | .... |
| 101 | 568 | 710 | 852 | 994 | 1136 | 1278 | 1420 | 1562 | 1704 | 1846 | 1988 | 2130 | 2272 |
| 102 | 579 | 724 | 869 | 1014 | 1158 | 1303 | 1448 | 1593 | 1738 | 1882 | 2027 | 2172 | 2317 |
| 103 | 591 | 739 | 886 | 1034 | 1182 | 1329 | 1477 | 1624 | 1772 | 1919 | 2067 | 2214 | 2363 |
| 104 | 602 | 753 | 903 | 1054 | 1204 | 1355 | 1505 | 1656 | 1806 | 1957 | 2107 | 2258 | 2409 |
| 105 | 614 | 768 | 921 | 1074 | 1228 | 1381 | 1534 | 1688 | 1841 | 1994 | 2148 | 2302 | 2455 |
| 106 | 626 | 782 | 939 | 1095 | 1251 | 1408 | 1564 | 1720 | 1877 | 2033 | 2189 | 2346 | 2502 |
| 107 | 637 | 797 | 956 | 1116 | 1275 | 1434 | 1593 | 1753 | 1912 | 2071 | 2231 | 2390 | 2550 |
| 108 | 649 | 812 | 974 | 1136 | 1299 | 1461 | 1623 | 1786 | 1948 | 2110 | 2273 | 2435 | 2598 |
| 109 | 662 | 827 | 992 | 1158 | 1323 | 1488 | 1653 | 1819 | 1984 | 2149 | 2315 | 2480 | 2646 |
| 110 | 673 | 842 | 1010 | 1179 | 1347 | 1516 | 1684 | 1853 | 2021 | 2189 | 2358 | 2526 | 2695 |
| 111 | 686 | 857 | 1028 | 1200 | 1372 | 1543 | 1715 | 1886 | 2058 | 2229 | 2401 | 2572 | 2744 |
| 112 | 693 | 873 | 1048 | 1222 | 1397 | 1571 | 1746 | 1920 | 2095 | 2270 | 2444 | 2619 | 2793 |
| 113 | 711 | 889 | 1066 | 1244 | 1422 | 1599 | 1777 | 1955 | 2133 | 2310 | 2488 | 2666 | 2844 |
| 114 | 724 | 904 | 1085 | 1266 | 1447 | 1628 | 1809 | 1990 | 2171 | 2351 | 2532 | 2713 | 2894 |
| 115 | 736 | 920 | 1104 | 1288 | 1473 | 1657 | 1841 | 2025 | 2209 | 2393 | 2577 | 2761 | 2945 |
| 116 | 749 | 936 | 1124 | 1311 | 1498 | 1686 | 1873 | 2060 | 2247 | 2435 | 2622 | 2809 | 2997 |
| 117 | 762 | 953 | 1143 | 1334 | 1524 | 1715 | 1905 | 2096 | 2286 | 2477 | 2667 | 2858 | 3048 |
| 118 | 775 | 969 | 1163 | 1357 | 1550 | 1744 | 1938 | 2132 | 2326 | 2519 | 2713 | 2907 | 3101 |
| 119 | 788 | 985 | 1183 | 1380 | 1577 | 1774 | 1971 | 2168 | 2365 | 2562 | 2759 | 2956 | 3154 |
| 120 | 802 | 1002 | 1203 | 1403 | 1604 | 1804 | 2005 | 2205 | 2406 | 2606 | 2807 | 3007 | 3208 |
| 121 | 815 | 1019 | 1223 | 1426 | 1630 | 1834 | 2038 | 2242 | 2445 | 2649 | 2853 | 3057 | 3260 |
| 122 | 829 | 1036 | 1243 | 1450 | 1657 | 1864 | 2072 | 2279 | 2486 | 2693 | 2900 | 3107 | 3314 |
| 123 | 842 | 1053 | 1263 | 1474 | 1685 | 1895 | 2106 | 2316 | 2527 | 2737 | 2948 | 3159 | 3369 |
| 124 | 855 | 1070 | 1284 | 1498 | 1712 | 1926 | 2140 | 2354 | 2568 | 2782 | 2996 | 3210 | 3424 |
| 125 | 870 | 1087 | 1305 | 1522 | 1740 | 1957 | 2175 | 2392 | 2610 | 2827 | 3045 | 3262 | 3480 |
| 126 | 884 | 1105 | 1326 | 1547 | 1768 | 1989 | 2210 | 2431 | 2652 | 2872 | 3093 | 3315 | 3535 |
| 127 | 898 | 1122 | 1347 | 1571 | 1796 | 2020 | 2245 | 2469 | 2694 | 2918 | 3143 | 3367 | 3592 |
| 128 | 912 | 1140 | 1368 | 1596 | 1824 | 2052 | 2280 | 2508 | 2736 | 2964 | 3192 | 3420 | 3649 |
| 129 | 926 | 1158 | 1390 | 1621 | 1853 | 2085 | 2316 | 2548 | 2779 | 3011 | 3242 | 3474 | 3706 |
| 130 | 941 | 1176 | 1411 | 1646 | 1882 | 2117 | 2352 | 2587 | 2822 | 3058 | 3293 | 3528 | 3764 |
| 131 | 955 | 1194 | 1433 | 1672 | 1911 | 2150 | 2389 | 2627 | 2866 | 3105 | 3344 | 3583 | 3822 |
| 132 | 970 | 1213 | 1455 | 1698 | 1940 | 2183 | 2425 | 2668 | 2910 | 3153 | 3395 | 3638 | 3880 |
| 133 | 985 | 1231 | 1477 | 1723 | 1970 | 2216 | 2462 | 2708 | 2954 | 3200 | 3446 | 3693 | 3939 |
| 134 | 1000 | 1250 | 1500 | 1750 | 1999 | 2249 | 2499 | 2749 | 2999 | 3249 | 3499 | 3749 | 3999 |
| 135 | 1015 | 1268 | 1522 | 1775 | 2030 | 2284 | 2537 | 2790 | 3044 | 3298 | 3551 | 3805 | 4059 |
| 136 | 1029 | 1286 | 1543 | 1801 | 2058 | 2315 | 2572 | 2830 | 3087 | 3344 | 3601 | 3859 | 4116 |
| 137 | 1044 | 1305 | 1566 | 1827 | 2088 | 2349 | 2610 | 2871 | 3132 | 3393 | 3654 | 3916 | 4177 |
| 138 | 1059 | 1324 | 1589 | 1854 | 2119 | 2384 | 2649 | 2914 | 3178 | 3443 | 3708 | 3973 | 4238 |
| 139 | 1075 | 1344 | 1612 | 1881 | 2150 | 2418 | 2687 | 2956 | 3225 | 3493 | 3762 | 4031 | 4300 |
| 140 | 1090 | 1363 | 1636 | 1908 | 2181 | 2453 | 2726 | 2999 | 3271 | 3544 | 3816 | 4089 | 4362 |
| 141 | 1106 | 1383 | 1659 | 1936 | 2212 | 2489 | 2765 | 3042 | 3318 | 3595 | 3871 | 4148 | 4424 |
| 142 | 1122 | 1402 | 1683 | 1963 | 2244 | 2524 | 2804 | 3085 | 3365 | 3646 | 3926 | 4207 | 4487 |
| 143 | 1138 | 1422 | 1706 | 1991 | 2275 | 2560 | 2844 | 3128 | 3413 | 3697 | 3982 | 4266 | 4551 |
| 144 | 1154 | 1442 | 1730 | 2019 | 2307 | 2596 | 2884 | 3172 | 3461 | 3749 | 4038 | 4326 | 4614 |

# WEIGHT COMPUTING FORMULAS

## HOT ROLLED AND COLD FINISHED STEEL PRODUCTS

### Structurals and Bar Shapes

| When information given is: | | | | Single Piece Weight Formula |
|---|---|---|---|---|
| Thickness | Width | Length | Diameter | |
| Wt. per Ft. | Inches | Feet | .... | Wt./Lin. Ft. x L |
| Inches | Inches | Feet | .... | Wt./Lin. Ft. x L |
| **Plates, Strip and Flat Bars** | | | | |
| Inches | Inches | Inches | .... | .2833 x T x W x L |
| Inches | Inches | Feet | .... | 3.4 x T x W x L |
| Inches | Feet | Feet | .... | 40.8 x T x W x L |
| USS. Ga. No. | Feet | Feet | .... | Wt./Sq. Ft. x W x L |
| Wt. per Sq. Ft. | Feet | Feet | .... | Wt./Sq. Ft. x W x L |
| **Sheets** | | | | |
| Inches | Inches | Inches | .... | .2904 x T x W x L |
| Inches | Inches | Feet | .... | 3.485 x T x W x L |
| Inches | Feet | Feet | .... | 41.82 x T x W x L |
| USS. Ga. No. | Feet | Feet | .... | Wt./Sq. Ft. x W x L |
| Wt. per Sq. Ft. | Feet | Feet | .... | Wt./Sq. Ft. x W x L |
| **Plate Circles** | | | | |
| Inches | .... | .... | Inches | .2225 x T x $D^2$ |
| Inches | .... | .... | Feet | 32.05 x T x $D^2$ |
| **Sheet Circles** | | | | |
| Inches | .... | .... | Inches | .228 x T x $D^2$ |
| Inches | .... | .... | Feet | 32.85 x T x $D^2$ |
| **Bars—Rounds, Squares, Hexagons and Octagons** | | | | |
| .... | .... | Feet | Inches | *Rds.* 2.67 x $D^2$ x L |
| .... | .... | Feet | Inches | *Sqs.* 3.4 x $D^2$ x L |
| .... | .... | Feet | Inches | *Hex.* 2.945 x $D^2$ x L |
| .... | .... | Feet | Inches | *Oct.* 2.817 x $D^2$ x L |

T = Thickness L = Length Wt./Lin. Ft. = Wt. per Lineal Ft. in Lbs.
D = Diameter W = Width Wt./Sq. Ft. = Wt. per Square Ft. in Lbs.

## SEAMLESS OR WELDED TUBING

### Hot Rolled or Cold Drawn Rounds

To determine the average wall weight of a tube:

$$W = 10.68\ (D - t)\ t$$

To determine the minimum wall weight of a tube:

$$W = 10.68\ (D - \frac{t}{.875})\ \frac{t}{.875}$$

To determine the single piece weight of a tube:

Wt. per length = 10.68 (D − t) t L

### Hot Rolled or Cold Drawn Squares

To determine the average wall weight of a tube:

$$W = 13.5984\ (D - t)\ t$$

W = Weight in pounds per foot (carried to 4 digits)
D = Outside Diameter in inches (to 3 decimal places)
t = Wall Thickness in inches (to 3 decimal places)
L = Length in feet

Weights are carried to four digits only, the fifth digit being carried forward if five or over, or dropped if under five.

# MECHANICAL PROPERTIES OF STEEL

These are *average* results from many tests and show *probable* mechanical expectancy of the steels listed. *In individual tests these steels may develop results differing widely from the averages shown.* The average properties shown are based on a 1" Rd. section except for the heat treated steels on which the size range is shown.

The size of the section, rolling temperature, permissible variation within analysis limits and the atmospheric temperature at time of rolling all influence the final mechanical properties of any steel. The mechanical properties of cold drawn steel are governed largely by the amount of size reduction during cold drawing. Dependable mechanical properties can be secured only through carefully controlled heat treatment.

All hot rolled and cold drawn steels are in the as-rolled condition except where noted. Yield Point shown for Quenched and Tempered Condition is determined by the "Dividers Method" of A.S.T.M. Spec. E8-54T.

## Case Hardening or Low Carbon Types

| AISI No. and Ryerson Color Marking | Condition of Steel | Tensile Strength PSI | Yield Point PSI | % Elong. in 2" | % Red. of Area | Hardness Brinell | Hardness Rockwell | % Machinability Rating |
|---|---|---|---|---|---|---|---|---|
| **Low Carbon Steel** Green | Hot R'd. | 63,000 | 46,000 | 38 | 62 | 126 | B72 | 50 |
| | Cold Dr. | 77,000 | 65,000 | 20 | 60 | 156 | B83 | 63 |
| **C 1015** Green | Hot R'd. | 61,000 | 45,500 | 39 | 61 | 126 | B72 | 50 |
| | Cold Dr. | 74,000 | 62,000 | 24 | 57 | 143 | B79 | 58 |
| **C 1018** Green | Hot R'd. | 69,000 | 48,000 | 38 | 62 | 143 | B79 | 52 |
| | Cold Dr. | 82,000 | 70,000 | 20 | 57 | 163 | B85 | 65 |
| | Carburized at 1700° F., cooled in box, reheated to 1425° F., water quenched, tempered at 350° F.—Core properties: | 92,000 | 56,000 | 27 | 48 | 197 | B91 | . . |
| **C 1019** Green | Hot R'd. | 71,000 | 51,000 | 37 | 60 | 149 | B81 | 53 |
| | Cold Dr. | 84,000 | 72,000 | 20 | 56 | 170 | B87 | 67 |
| **C 1020** Green | Hot R'd. | 65,000 | 43,000 | 36 | 59 | 143 | B79 | 50 |
| | Cold Dr. | 78,000 | 66,000 | 20 | 55 | 156 | B83 | 60 |
| **C 1025** Green | Hot R'd. | 67,000 | 45,000 | 36 | 58 | 143 | B79 | 50 |
| | Cold Dr. | 80,000 | 68,000 | 20 | 55 | 163 | B85 | 60 |
| **B 1112** White | Cold Dr. | 82,500 | 71,000 | 15 | 43 | 170 | B87 | 100 |
| **B 1113** Orange | Cold Dr. | 83,500 | 72,000 | 14 | 40 | 170 | B87 | 130 |
| **Ledloy** Purple | Cold Dr. | 79,000 | 71,000 | 16 | 52 | 163 | B86 | 180 |
| **C 1117** Gold | Hot R'd. | 70,600 | 44,300 | 33 | 63 | 137 | B76 | 85 |
| | Cold Dr. | 84,000 | 74,000 | 21 | 52 | 170 | B87 | 90 |
| **C 1213** | Cold Dr. | 76,000 | 68,000 | 18 | 53 | 156 | B83 | 130 |
| **Ryerson Rycase** Gold | Hot R'd. | 70,600 | 44,300 | 33 | 63 | 137 | B76 | 85 |
| | Cold Dr. | 84,000 | 74,000 | 21 | 52 | 170 | B87 | 90 |
| | Carburized at 1700° F., cooled in box, reheated to 1450° F., water quenched, tempered at 350° F.—Core properties: | 96,500 | 59,300 | 23 | 53 | 192 | B93 | . . |
| **Ryerson Leaded Rycase** Gold with Purple Dot | Cold Dr. | 84,000 | 75,000 | 22 | 52 | 170 | B87 | 125 |
| | Carbonized at 1700° F., cooled in box, reheated to 1450° F., water quenched, tempered at 350° F.—Core properties: | 96,500 | 59,300 | 23 | 53 | 192 | B93 | . . |
| **Rycut 20** Purple and Green | Hot R'd. | 91,000 | 64,000 | 24 | 62 | 187 | B90 | 85 |
| | Cold Dr. | 101,000 | 84,000 | 22 | 58 | 207 | C15 | 90 |
| | Carburized at 1700° F., cooled in box, reheated to 1550° F., oil quenched, tempered at 300° F.—Core properties: | 124,000 | 93,000 | 20 | 54 | 269 | C29 | . . |
| **4615** | Hot R'd. | 82,000 | 62,000 | 28 | 65 | 183 | B90 | 58 |
| | Cold Dr. | 99,000 | 84,600 | 15 | 61 | 207 | C15 | 62 |
| | Carburized at 1700° F., cooled in box, reheated to 1550° F., oil quenched, tempered at 300° F.—Core properties: | 110,000 | 80,000 | 25 | 61 | 229 | C20 | . . |
| **4620** White and Green | Hot R'd. | 85,000 | 63,000 | 28 | 64 | 183 | B90 | 59 |
| | Cold Dr. | 101,000 | 85,000 | 22 | 60 | 207 | C15 | 64 |
| | Carburized at 1700° F., cooled in box, reheated to 1550° F., oil quenched, tempered at 300° F.—Core properties: | 120,000 | 89,000 | 22 | 55 | 248 | C24 | . . |

(Continued)

# MECHANICAL PROPERTIES OF STEEL

## Case Hardening or Low Carbon Grades, *Continued*

| AISI No. and Ryerson Color Marking | Condition of Steel | Tensile Strength PSI | Yield Point PSI | % Elong. in 2" | % Red. of Area | Hardness Brinell | Hardness Rockwell | % Machinability Rating |
|---|---|---|---|---|---|---|---|---|
| **4815** | Hot R'd | 105,000 | 73,000 | 24 | 58 | 217 | C18 | 50 |
| | Cold Dr. | 110,000 | 95,000 | 23 | 55 | 223 | C19 | 55 |
| | Carburized at 1700° F., cooled in box, reheated to 1525° F., oil quenched, tempered at 300° F.—Core properties: | | | | | | | |
| | | 156,000 | 132,000 | 15 | 55 | 331 | C36 | .. |
| **E 8615** Orange & Green, White Dot | Hot R'd. | 82,000 | 60,000 | 31 | 62 | 149 | B81 | 70 |
| | Carburized at 1700° F. for 8 hours, pot cooled, reheated to 1550° F., oil quenched, tempered at 300° F.—Core properties: | | | | | | | |
| | | 109,000 | 76,000 | 17 | 52 | 255 | C25 | .. |
| **8620** Orange and Green | Hot R'd. | 93,000 | 65,000 | 25 | 63 | 192 | B90 | 60 |
| | Cold Dr. | 102,000 | 85,000 | 22 | 58 | 212 | C16 | 63 |
| | Carburized at 1700° F., cooled in box, reheated to 1550° F., oil quenched, tempered at 300° F.—Core properties: | | | | | | | |
| | | 122,000 | 91,000 | 21 | 52 | 255 | C25 | .. |
| **Leaded 8620** Purple and Green | Hot R'd. | 92,000 | 65,000 | 24 | 61 | 192 | B90 | 85 |
| | Cold Dr. | 101,000 | 85,000 | 21 | 56 | 212 | C16 | 90 |
| | Carburized at 1700° F., cooled in box, reheated to 1550° F., oil quenched, tempered at 300° F.—Core properties: | | | | | | | |
| | | 124,000 | 94,000 | 21 | 54 | 269 | C29 | .. |
| **E 9310** Green and Gold | Hot R'd. | 115,000 | 75,000 | 22 | 58 | 241 | C23 | 45 |
| | Cold Dr. | 120,000 | 95,000 | 19 | 56 | 255 | C25 | 51 |
| | Carburized at 1700° F. for 8 hours, pot cooled, re-heated to 1450° F., oil quenched, tempered at 300° F.—Core properties: | | | | | | | |
| | | 173,000 | 135,000 | 15.5 | 55 | 263 | C39 | .. |
| **Hi-Steel (as rolled)** White | Thick. less than .125" | 75,000 | 60,000 | 20 | .. | ... | .. | .. |
| | Thick. .125" to ¾" | 75,000 | 55,000 | .. | 55 | ... | .. | .. |

## Medium Carbon or Direct Hardening Steels

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **C 1035** Blue | Hot R'd. | 85,000 | 54,000 | 30 | 53 | 183 | B90 | 65 |
| | Cold Dr. | 92,000 | 79,000 | 25 | 50 | 201 | B94 | 67 |
| | Water Quenched 1550° F.—Tempered | | | | | | | |
| | 1000° F. | 103,000 | 72,000 | 23 | 59 | 201 | B94 | .. |
| **C 1040** Yellow | Hot R'd. | 91,000 | 58,000 | 27 | 50 | 201 | B94 | 63 |
| | Cold Dr. | 100,000 | 88,000 | 17 | 42 | 207 | C15 | 65 |
| | Water Quenched 1550° F.—Tempered | | | | | | | |
| | 1000° F. | 113,000 | 86,000 | 23 | 62 | 235 | C22 | .. |
| **C 1042** Yellow | Hot R'd. | 93,000 | 59,000 | 26 | 50 | 201 | B94 | 61 |
| | Cold Dr. | 102,000 | 89,000 | 16 | 40 | 207 | C15 | 63 |
| | Water Quenched 1550° F.—Tempered | | | | | | | |
| | 1000° F. | 116,000 | 90,000 | 22 | 60 | 235 | C22 | .. |
| **C 1045** Yellow | Hot R'd. | 98,000 | 59,000 | 24 | 45 | 212 | C16 | 56 |
| | Cold Dr. | 103,000 | 90,000 | 14 | 40 | 217 | C18 | 60 |
| | Water Quenched 1500° F.—Tempered | | | | | | | |
| | 1000° F. | 120,000 | 90,000 | 18 | 52 | 240 | C22 | .. |
| **C 1095** Pink | Hot R'd. | 142,000 | 83,000 | 8 | 18 | 293 | C28 | .. |
| | Water Quenched 1450° F.—Tempered | | | | | | | |
| | 800° F. | 200,000 | 138,000 | 12 | 37 | 388 | C42 | .. |
| **C 1137** Brown and Blue | Hot R'd. | 92,000 | 57,000 | 27 | 61 | 192 | B92 | 70 |
| | Cold Dr. | 105,000 | 90,000 | 15 | 38 | 207 | C15 | 75 |
| | Oil Quenched 1550° F.—Tempered | | | | | | | |
| | 1000° F. | 112,000 | 88,000 | 21 | 56 | 255 | C25 | .. |
| **C 1141** Brown | Hot R'd. | 97,000 | 59,000 | 25 | 52 | 201 | B94 | 67 |
| | Cold Dr. | 110,000 | 93,000 | 14 | 40 | 223 | C19 | 74 |
| | Oil Quenched 1550° F.—Tempered | | | | | | | |
| | 1000° F. | 126,000 | 100,000 | 19 | 54 | 269 | C27 | .. |
| **Rytense** Brown | Hot R'd. | 97,000 | 60,000 | 25 | 51 | 201 | B94 | 75 |
| | Cold Dr. | 110,000 | 93,000 | 14 | 40 | 223 | C19 | 78 |
| | Oil Quenched 1550° F.—Tempered | | | | | | | |
| | 1000° F. | 126,000 | 100,000 | 19 | 54 | 277 | C29 | .. |
| **3140** Yellow with Blue Dot | *Hot R'd. | 96,000 | 64,000 | 26 | 56 | 197 | B93 | 55 |
| | *Cold Dr. | 104,000 | 91,300 | 17 | 48 | 212 | C16 | 64 |
| | Oil Quenched 1550° F.—Tempered | | | | | | | |
| | 1000° F. | 149,000 | 128,000 | 16 | 45 | 302 | C32 | .. |
| **3150** | *Hot R'd. | 104,000 | 73,000 | 19 | 50 | 212 | C16 | 50 |
| | Oil Quenched 1550° F.—Tempered | | | | | | | |
| *(Continued)* | 1000° F. | 155,000 | 132,000 | 14 | 42 | 311 | C33 | .. |

# MECHANICAL PROPERTIES OF STEEL

## Medium Carbon or Direct Hardening Steels, *Continued*

| AISI No. and Ryerson Color Marking | Condition of Steel | Tensile Strength PSI | Yield Point PSI | % Elong. in 2" | % Red. of Area | Hardness Brinell | Hardness Rockwell | % Machinability Rating |
|---|---|---|---|---|---|---|---|---|
| **4130** | *Hot R'd. | 90,000 | 60,000 | 30 | 45 | 183 | B90 | 65 |
| | *Cold Dr. | 98,000 | 87,000 | 21 | 52 | 201 | B94 | 70 |
| | Water Quenched 1575° F.—Tempered 1000° F. | 146,000 | 133,000 | 17 | 60 | 293 | C31 | .. |
| | .250" Thick Sheet, Water Quenched 1550° F.—Tempered 1000° F. | 152,000 | 138,000 | 12 | .. | 302 | C32 | .. |
| **4140** Black and Yellow | *Hot R'd. | 90,000 | 63,000 | 27 | 58 | 187 | B91 | 57 |
| | *Cold Dr. | 102,000 | 90,000 | 18 | 50 | 223 | C19 | 66 |
| | Oil Quenched 1550° F.—Tempered 1000° F. | 153,000 | 131,000 | 16 | 45 | 302 | C32 | .. |
| **Leaded 4140-42** Purple & Yellow | *Hot R'd. | 89,000 | 62,000 | 26 | 58 | 187 | B91 | 85 |
| | *Cold Dr. | 101,000 | 91,000 | 18 | 51 | 223 | C19 | 90 |
| | Oil Quenched 1550° F.—Tempered 1000° F. | 153,000 | 132,000 | 16 | 45 | 311 | C33 | .. |
| **4150** Black & Pink | *Hot R'd. | 100,000 | 66,000 | 21 | 51 | 197 | B93 | 54 |
| | Oil Quenched 1550° F.—Tempered 1000° F. | 158,000 | 134,000 | 14 | 42 | 311 | C33 | .. |
| **Rycut 40** Purple and Yellow | *Hot R'd. | 88,000 | 61,000 | 25 | 58 | 187 | B91 | 85 |
| | *Cold Dr. | 102,000 | 91,000 | 18 | 51 | 223 | C19 | 90 |
| | Oil Quenched 1550° F.—Tempered 1000° F. | 154,000 | 133,000 | 16 | 44 | 311 | C33 | .. |
| **Rycut 47** Purple & Yellow with Orange dot | *Hot R'd. | 98,000 | 57,000 | 22 | 49 | 197 | B92 | 80 |
| | Oil Quenched 1550° F.—Tempered 1000° F. | 152,000 | 130,000 | 15 | 44 | 311 | C32 | .. |
| **New Rycut 50** Purple and Pink | Hot R'd. | 103,000 | 69,000 | 19 | 50 | 212 | C16 | 80 |
| | *Cold Dr. | 112,000 | 95,000 | 16 | 43 | 223 | C19 | 85 |
| | Oil Quenched 1550° F.—Tempered 1000° F. | 162,000 | 138,000 | 14 | 40 | 311 | C34 | .. |
| **Rycut 50** Purple & Pink with Black Dot | *Hot R'd. | 102,000 | 67,000 | 20 | 50 | 212 | C16 | 71 |
| | Oil Quenched 1550° F.—Tempered 1000° F. | 160,000 | 135,000 | 14 | 41 | 311 | C34 | .. |
| **4340** White and Yellow | *Hot R'd. | 101,000 | 69,000 | 21 | 45 | 207 | C15 | 45 |
| | *Cold Dr. | 111,000 | 99,000 | 16 | 42 | 223 | C19 | 55 |
| | Oil Quenched 1550° F.—Tempered 1000° F. | 182,000 | 162,000 | 15 | 40 | 363 | C39 | .. |
| **E 52100** Aluminum and Pink | *Hot R'd. | 100,000 | 81,000 | 25 | 57 | 192 | B92 | .. |
| | Oil Quenched 1575° F.—Tempered 300° F. | ..... | ..... | .. | .. | ... | C63 | .. |
| **E 6150** Gold & Pink | *Hot R'd. | 91,000 | 58,000 | 22 | 53 | 183 | B90 | 50 |
| | Oil Quenched 1550° F.—Tempered 1000° F. | 155,000 | 132,000 | 15 | 44 | 302 | C32 | .. |
| **8642** Orange and Yellow | *Hot R'd. | 93,000 | 63,000 | 27 | 57 | 192 | B92 | 56 |
| | *Cold Dr. | 105,000 | 90,000 | 18 | 49 | 223 | C19 | 66 |
| | Oil Quenched 1550° F.—Tempered 1000° F. | 149,000 | 128,000 | 16 | 45 | 302 | C32 | .. |
| **8650** | *Hot R'd. | 99,000 | 58,000 | 20 | 48 | 197 | B93 | 54 |
| | Oil Quenched 1550° F.—Tempered 1000° F. | 155,000 | 132,000 | 14 | 42 | 311 | C33 | .. |
| **8740** | *Hot R'd. | 95,000 | 64,000 | 25 | 55 | 190 | B92 | 56 |
| | *Cold Dr. | 107,000 | 96,000 | 17 | 48 | 223 | C19 | 66 |
| | Oil quenched from 1525°, tempered at 1000°; Ht. Tr'td | 152,000 | 129,000 | 15 | 44 | 302 | C32 | .. |
| **9255** | *Hot R'd. | 115,000 | 78,000 | 22 | 45 | 223 | C20 | 42 |
| | Oil Quenched 1625° F.—Tempered 1000° F. | 180,000 | 160,000 | 15 | 32 | 352 | C36 | .. |

* Annealed.

*For mechanical properties of Heat Treated and Stainless steels see next page.*

## MECHANICAL PROPERTIES HEAT TREATED STEEL

These steels are sold in the Heat Treated condition on the basis of these typical *minimum* mechanical properties. The properties shown are at center of bars up to 1½", and at half radius of bars over 1½". Yield Point is determined by the "Dividers Method" of A.S.T.M. Spec. E8-54T.

| AISI No. and Ryerson Color Marking | Condition of Steel | Tensile Strength psi | Yield Point psi | % Elong. in 2" | % Red. of Area | Approx. Hardness Brinell | Approx. Hardness Rock. C | % Machinability Rating |
|---|---|---|---|---|---|---|---|---|
| **Stress-proof** Brown & Yellow | Cold Dr. ⅜ to 2" | *125,000 | 100,000 | *10 | *35 | *269 | *27 | 76 |
| | Over 2 to 3¼" | *120,000 | 90,000 | *10 | *30 | *248 | *24 | 76 |
| | *Indicates Average Properties | | | | | | | |
| **Ryco-44** Brown & Yellow— Black Dot | Cold Dr. ⅜ to 2" | ..... | 100,000 | 10 | 30 | *269 | *28 | 76 |
| | Over 2" | ..... | 90,000 | 10 | 30 | *248 | *24 | 76 |
| | *Indicates Average Properties | | | | | | | |
| **Rycrome** Black with Yellow Dot | Hot R'd. & Cold Finished 2½" & under | 125,000 | 105,000 | 16 | 50 | 269/321 | 27/34 | 55 |
| | Over 2½ to 4" | 115,000 | 95,000 | 16 | 50 | 255/321 | 25/34 | 55 |
| | Over 4" Rd. | 110,000 | 85,000 | 16 | 45 | 248/321 | 24/34 | 55 |
| **Rycut 40 Heat Treated** Purple with Yellow Dot | Hot R'd. & Cold Finished 2½" & under | 125,000 | 105,000 | 16 | 50 | 269/321 | 27/34 | * |
| | Over 2½ to 4" | 115,000 | 95,000 | 16 | 50 | 255/321 | 25/34 | * |
| | Over 4" Rd. | 110,000 | 85,000 | 16 | 45 | 248/321 | 24/34 | * |
| | *Hot Rolled 70; Cold Finished, 74 | | | | | | | |
| **New Rycut 50 Heat Treated** Purple with Pink Dot | Hot R'd. 2½" & under | 140,000 | 120,000 | 15 | 50 | 297/341 | 32/37 | 65 |
| | Over 2½ to 4" | 135,000 | 110,000 | 15 | 45 | 277/341 | 29/37 | 65 |
| | Over 4 to 6" | 125,000 | 100,000 | 15 | 40 | 269/341 | 28/37 | 65 |
| | Over 6 to 8" | 120,000 | 95,000 | 15 | 40 | 255/341 | 25/37 | 65 |
| | Over 8" to 9½" incl. | 115,000 | 85,000 | 15 | 40 | 255/341 | 25/37 | 65 |
| **Rycut 50 Heat Treated** Purple & Black with Pink Dot | Hot R'd. Squares & Flats 2½" & under | 140,000 | 120,000 | 15 | 50 | 297/341 | 32/37 | 62 |
| | Over 2½ to 4" incl. | 135,000 | 110,000 | 15 | 45 | 277/341 | 29/37 | 62 |
| **Nitralloy 135 Modified** Blue with Yellow Dot | Hot R'd. & Cold Finished All Sizes | 110,000 | 85,000 | 18 | 50 | 223/263 | 19/27 | 50 |

## MECHANICAL PROPERTIES—STAINLESS STEELS

| AISI Type No. | Condition | Tensile Strength psi | Yield Strength psi | % Elong. in 2" | % Red. of Area | Hardness Brinell | Hardness Rockwell | Machinability Rating |
|---|---|---|---|---|---|---|---|---|
| 302 | Annealed | 80,000 | 30,000 | 50 | 60 | 180 Max. | B90 Max. | 45 |
| 304 | Annealed | 80,000 | 30,000 | 50 | 60 | 180 Max. | B90 Max. | 45 |
| 303 | Annealed | 75,000 | 30,000 | 40 | 50 | 160 Min. | B80 Min. | 60 |
| 309 | Annealed | 75,000 | 30,000 | 40 | 50 | 200 Max. | B95 Max. | |
| 310 | Annealed | 75,000 | 30,000 | 40 | 50 | 180 Max. | B90 Max. | |
| 316 | Annealed | 75,000 | 30,000 | 40 | 50 | 200 Max. | B95 Max. | |
| 321 | Annealed | 75,000 | 30,000 | 40 | 50 | 200 Max. | B95 Max. | |
| 410 | Annealed | 60,000 | 32,000 | 20 | 50 | 200 Max. | B95 Max. | 54 |
| | H. T. | 60,000/200,000 | 35,000/180,000 | 25/2 | 50 | 120/400 | B70/C45 | 54 |
| 416 | Annealed | 85,000 | 50,000 | 15 | 40 | 180 Min. | B90 Min. | 90 |
| | H. T. | 90,000/140,000 | 50,000/115,000 | 25/15 | 40 | 180-280 | B90-C30 | 90 |
| 430 | Annealed | 60,000 | 35,000 | 20 | 40 | 200 Max. | B95 Max. | 54 |
| 430-F | Annealed | 60,000 | 35,000 | 15 | 40 | | | 90 |
| 440-C | Annealed | 100,000 | 60,000 | 8 | 35 | 260 Max. | B105 Max. | |
| | H. T. | 100,000/485,000 | 60,000/275,000 | 8/1 | 35 | 200/600 | B95/C58 | |

# AISI & SAE STANDARD STEEL COMPOSITIONS

## CARBON STEELS (Revised April, 1956)

Basic Open Hearth and Acid Bessemer

| AISI No.* | C | Mn | P Max. | S Max. | SAE No. |
|---|---|---|---|---|---|
| C 1008 | 0.10 max. | 0.25-0.50 | .040 | .050 | 1008 |
| C 1010 | 0.08-0.13 | 0.30-0.60 | .040 | .050 | 1010 |
| C 1011 | 0.08-0.13 | 0.60-0.90 | .040 | .050 | 1011 |
| C 1012 | 0.10-0.15 | 0.30-0.60 | .040 | .050 | .... |
| C 1015 | 0.13-0.18 | 0.30-0.60 | .040 | .050 | 1015 |
| C 1016 | 0.13-0.18 | 0.60-0.90 | .040 | .050 | 1016 |
| C 1017 | 0.15-0.20 | 0.30-0.60 | .040 | .050 | 1017 |
| C 1018 | 0.15-0.20 | 0.60-0.90 | .040 | .050 | 1018 |
| C 1019 | 0.15-0.20 | 0.70-1.00 | .040 | .050 | 1019 |
| C 1020 | 0.18-0.23 | 0.30-0.60 | .040 | .050 | 1020 |
| C 1021 | 0.18-0.23 | 0.60-0.90 | .040 | .050 | .... |
| C 1022 | 0.18-0.23 | 0.70-1.00 | .040 | .050 | 1022 |
| C 1023 | 0.20-0.25 | 0.30-0.60 | .040 | .050 | .... |
| C 1024 | 0.19-0.25 | 1.35-1.65 | .040 | .050 | 1024 |
| C 1025 | 0.22-0.28 | 0.30-0.60 | .040 | .050 | 1025 |
| C 1026 | 0.22-0.28 | 0.60-0.90 | .040 | .050 | .... |
| C 1027 | 0.22-0.29 | 1.20-1.50 | .040 | .050 | 1027 |
| C 1029 | 0.25-0.31 | 0.60-0.90 | .040 | .050 | ..... |
| C 1030 | 0.28-0.34 | 0.60-0.90 | .040 | .050 | 1030 |
| C 1033 | 0.30-0.36 | 0.70-1.00 | .040 | .050 | 1033 |
| C 1035 | 0.32-0.38 | 0.60-0.90 | .040 | .050 | 1035 |
| C 1036 | 0.30-0.37 | 1.20-1.50 | .040 | .050 | 1036 |
| C 1037 | 0.35-0.42 | 0.40-0.70 | .040 | .050 | .... |
| C 1038 | 0.35-0.42 | 0.60-0.90 | .040 | .050 | 1038 |
| C 1039 | 0.37-0.44 | 0.70-1.00 | .040 | .050 | 1039 |
| C 1040 | 0.37-0.44 | 0.60-0.90 | .040 | .050 | 1040 |
| C 1041 | 0.36-0.44 | 1.35-1.65 | .040 | .050 | 1041 |
| C 1042 | 0.40-0.47 | 0.60-0.90 | .040 | .050 | 1042 |
| C 1043 | 0.40-0.47 | 0.70-1.00 | .040 | .050 | 1043 |
| C 1045 | 0.43-0.50 | 0.60-0.90 | .040 | .050 | 1045 |
| C 1046 | 0.43-0.50 | 0.70-1.00 | .040 | .050 | 1046 |
| C 1049 | 0.46-0.53 | 0.60-0.90 | .040 | .050 | 1049 |
| C 1050 | 0.48-0.55 | 0.60-0.90 | .040 | .050 | 1050 |
| C 1051 | 0.45-0.56 | 0.85-1.15 | .040 | .050 | 1051 |
| C 1052 | 0.47-0.55 | 1.20-1.50 | .040 | .050 | 1052 |
| C 1053 | 0.48-0.55 | 0.70-1.00 | .040 | .050 | .... |
| C 1055 | 0.50-0.60 | 0.60-0.90 | .040 | .050 | 1055 |
| C 1060 | 0 55-0 65 | 0.60-0.90 | .040 | .050 | 1060 |
| C 1070 | 0.65-0.75 | 0.60-0.90 | .040 | .050 | 1070 |
| C 1078 | 0.72-0.85 | 0.30-0.60 | .040 | .050 | 1078 |
| C 1080 | 0.75-0.88 | 0.60-0.90 | .040 | .050 | 1080 |
| C 1084 | 0.80-0.93 | 0.60-0.90 | .040 | .050 | .... |
| C 1085 | 0.80-0.93 | 0.70-1.00 | .040 | .050 | 1085 |
| C 1086 | 0.82-0.95 | 0.30-0.50 | .040 | .050 | 1086 |
| C 1090 | 0.85-0.98 | 0.60-0.90 | .040 | .050 | 1090 |
| C 1095 | 0.90-1.03 | 0.30-0.50 | .040 | .050 | 1095 |
| B 1010 | 0.13 max. | 0.30-0.60 | .07-.12 | .060 | ..... |

* Prefix C denotes basic open-hearth carbon steels; B, acid-bessemer.

**When Silicon is required,** the following ranges and limits are commonly used for basic open-hearth steel grades:

| Standard Steel Designation | Silicon Ranges or Limits |
|---|---|
| Up to C 1015 Excl. | 0.10 max. |
| C 1015 to C 1025 Incl. | 0.10 max., 0.10/0.20, or 0.15/0.30 |
| Over C 1025 | 0.10/0.20, or 0.15/0.30 |

**Copper** is specified as an added element when required.

*(Continued)*

# AISI & SAE STANDARD STEEL COMPOSITIONS

## CARBON STEELS, *Continued*

Basic Open Hearth & Acid Bessemer—Resulphurized

| AISI No.* | C | Mn | P Max. | S Max. | SAE No. |
|---|---|---|---|---|---|
| C 1108 | .08-.13 | 0.50-0.80 | .040 | .08-.13 | ..... |
| C 1109 | .08-.13 | 0.60-0.90 | .040 | .08-.13 | 1109 |
| C 1110 | .08-.13 | 0.30-0.60 | .040 | .08-.13 | .... |
| B 1111 | .13 max. | 0.60-0.90 | .07-.12 | .08-.15 | 1111 |
| B 1112 | .13 max. | 0.70-1.00 | .07-.12 | .16-.23 | 1112 |
| B 1113 | .13 max. | 0.70-1.00 | .07-.12 | .24-.33 | 1113 |
| C 1113 | .10-.16 | 1.00-1 30 | .040 | .24-.33 | .... |
| C 1115 | .13-.18 | 0.60-0.90 | .040 | .08-.13 | 1115 |
| C 1117 | .14-.20 | 1.00-1.30 | .040 | .08-.13 | 1117 |
| C 1118 | .14-.20 | 1.30-1.60 | .040 | .08-.13 | 1118 |
| C 1119 | .14-.20 | 1.00-1.30 | .040 | .24-.33 | 1119 |
| C 1120 | .18-.23 | 0.70-1.00 | .040 | .08-.13 | 1120 |
| C 1125 | .22-.28 | 0.60-0.90 | .040 | .08-.13 | .... |
| C 1126 | .23-.29 | 0.70-1.00 | .040 | .08-.13 | 1126 |
| C 1132 | .27-.34 | 1.35-1.65 | .040 | .08-.13 | 1132 |
| C 1137 | .32-.39 | 1.35-1.65 | .040 | .08-.13 | 1137 |
| C 1138 | .34-.40 | 0.70-1.00 | .040 | .08-.13 | 1138 |
| C 1139 | .35-.43 | 1.35-1.65 | .040 | .12-.20 | 1139 |
| C 1140 | .37-.44 | 0.70-1.00 | .040 | .08-.13 | 1140 |
| C 1141 | .37-.45 | 1.35-1.65 | .040 | .08-.13 | 1141 |
| C 1144 | .40-.48 | 1.35-1.65 | .040 | .24-.33 | 1144 |
| C 1145 | .42-.49 | 0.70-1.00 | .040 | .04-.07 | 1145 |
| C 1146 | .42-.49 | 0.70-1.00 | .040 | .08-.13 | 1146 |
| C 1148 | .45-.52 | 0.70-1.00 | .040 | .04-.07 | .... |
| C 1151 | .48-.55 | 0.70-1.00 | .040 | .08-.13 | 1151 |
| **Basic Open Hearth Rephosphorized, Resulphurized & Lead Bearing** | | | | | |
| C 1211 | .13 max. | 0.60-0.90 | .07-.12 | .08-.15 | 1111 |
| C 1212 | .13 max. | 0.70-1.00 | .07-.12 | .16-.23 | 1112 |
| C 1213 | .13 max. | 0.70-1.00 | .07-.12 | .24-.33 | 1113 |
| †Ledloy | .15 max. | 0.75-1.25 | .04-.09 | .25-.35 | ..... |

* Prefix C denotes basic open hearth carbon steels; B, acid-bessemer.
† Ledloy has 0.15 to 0.35% lead added.

**When Silicon is required,** the following ranges and limits are commonly used for basic open hearth steel grades:

| Standard Steel Designation | Silicon Ranges or Limits |
|---|---|
| Up to C 1113 Excl. | 0.10 max. |
| C 1113 and Over | 0.10 max., 0.10/0.20, or 0.15/0.30 |

It is common practice not to produce basic open hearth or acid bessemer rephosphorized and resulphurized carbon steels to specified limits for silicon.

## MECHANICAL TUBING—Seamless and Welded

Low Carbon—Open Hearth

| AISI No. | C** | Mn | P Max. | S Max. |
|---|---|---|---|---|
| MT 1010 | .05/.15 | 0.30/0.60 | .040 | .050 |
| MT 1015 | .10/.20 | 0.30/0.60 | .040 | .050 |
| MT 1020 | .15/.25 | 0.30/0.60 | .040 | .050 |

** Carbon limits are minimum and maximum on check analysis, while the other elements are subject to AISI Standard Variations for check analyses.

## ALLOY STEELS—Open-Hearth and Electric Furnace

*(See Next Three Pages)*

# AISI & SAE STANDARD STEEL COMPOSITIONS

## ALLOY STEELS (Revised July, 1955)

Open Hearth and Electric Furnace

| AISI No.* | C | Mn | Ni | Cr | Mo | Other Elements | SAE No. |
|---|---|---|---|---|---|---|---|
| **Manganese Steels** | | | | | | | |
| 1330 | .28-0.33 | 1.60-1.90 | ..... | ..... | ..... | a,b | 1330 |
| 1335 | .33-0.38 | 1.60-1.90 | ..... | ..... | ..... | a,b | 1335 |
| 1340 | .38-0.43 | 1.60-1.90 | ..... | ..... | ..... | a,b | 1340 |
| 1345 | .43-0.48 | 1.60-1.90 | ..... | ..... | ..... | a,b | 1345 |
| **Nickel Steels** | | | | | | | |
| 2317 | .15-0.20 | 0.40-0.60 | 3.25-3.75 | ..... | ..... | a,b | 2317 |
| 2515 | .12-0.17 | 0.40-0.60 | 4.75-5.25 | ..... | ..... | a,b | 2515 |
| †E 2517 | .15-0.20 | 0.45-0.60 | 4.75-5.25 | ..... | ..... | a,b | 2517 |
| **Nickel—Chromium Steels** | | | | | | | |
| 3120 | .17-0.22 | 0.60-0.80 | 1.10-1.40 | 0.55-0.75 | ..... | a,b | 3120 |
| 3130 | .28-0.33 | 0.60-0.80 | 1.10-1.40 | 0.55-0.75 | ..... | a,b | 3130 |
| 3135 | .33-0.38 | 0.60-0.80 | 1.10-1.40 | 0.55-0.75 | ..... | a,b | 3135 |
| 3140 | .38-0.43 | 0.70-0.90 | 1.10-1.40 | 0.55-0.75 | ..... | a,b | 3140 |
| †E 3310 | .08-0.13 | 0.45-0.60 | 3.25-3.75 | 1.40-1.75 | ..... | a,b | 3310 |
| †E 3316 | .14-0.19 | 0.45-0.60 | 3.25-3.75 | 1.40-1.75 | ..... | a,b | 3316 |
| **Molybdenum Steels** | | | | | | | |
| 4023 | .20-0.25 | 0.75-0.90 | ..... | ..... | .20-.30 | a,b | 4023 |
| 4024 | .20-0.25 | 0.70-0.90 | ..... | ..... | .20-.30 | b,c | 4024 |
| 4027 | .25-0.30 | 0.70-0.90 | ..... | ..... | .20-.30 | a,b | 4027 |
| 4028 | .25-0.30 | 0.70-0.90 | ..... | ..... | .20-.30 | b,c | 4028 |
| 4032 | .30-0.35 | 0.70-0.90 | ..... | ..... | .20-.30 | a,b | 4032 |
| 4037 | .35-0.40 | 0.70-0.90 | ..... | ..... | .20-.30 | a,b | 4037 |
| 4042 | .40-0.45 | 0.70-0.90 | ..... | ..... | .20-.30 | a,b | 4042 |
| 4047 | .45-0.50 | 0.70-0.90 | ..... | ..... | .20-.30 | a,b | 4047 |
| 4053 | .50-0.56 | 0.75-1.00 | ..... | ..... | .20-.30 | a,b | 4053 |
| 4063 | .60-0.67 | 0.75-1.00 | ..... | ..... | .20-.30 | a,b | 4063 |
| 4068 | .63-0.70 | 0.75-1.00 | ..... | ..... | .20-.30 | a,b | 4068 |
| **Chromium—Molybdenum Steels** | | | | | | | |
| 4118 | .18-0.23 | 0.70-0.90 | ..... | 0.40-0.60 | .08-.15 | a,b | 4118 |
| 4130 | .28-0.33 | 0.40-0.60 | ..... | 0.80-1.10 | .15-.25 | a,b | 4130 |
| 4135 | .33-0.38 | 0.70-0.90 | ..... | 0.80-1.10 | .15-.25 | a,b | .... |
| 4137 | .35-0.40 | 0.70-0.90 | ..... | 0.80-1.10 | .15-.25 | a,b | 4137 |
| 4140 | .38-0.43 | 0.75-1.00 | ..... | 0.80-1.10 | .15-.25 | a,b | 4140 |
| 4142 | .40-0.45 | 0.75-1.00 | ..... | 0.80-1.10 | .15-.25 | a,b | 4142 |
| 4145 | .43-0.48 | 0.75-1.00 | ..... | 0.80-1.10 | .15-.25 | a,b | 4145 |
| 4147 | .45-0.50 | 0.75-1.00 | ..... | 0.80-1.10 | .15-.25 | a,b | 4147 |
| 4150 | .48-0.53 | 0.75-1.00 | ..... | 0.80-1.10 | .15-.25 | a,b | 4150 |
| **Nickel—Chromium—Molybdenum Steels** | | | | | | | |
| 4320 | .17-0.22 | 0.45-0.65 | 1.65-2.00 | 0.40-0.60 | .20-.30 | a,b | 4320 |
| 4337 | .35-0.40 | 0.60-0.80 | 1.65-2.00 | 0.70-0.90 | .20-.30 | a,b | 4337 |
| E4337 | .35-0.40 | 0.65-0.85 | 1.65-2.00 | 0.70-0.90 | .20-.30 | a,b | .... |
| 4340 | .38-0.43 | 0.60-0.80 | 1.65-2.00 | 0.70-0.90 | .20-.30 | a,b | 4340 |
| E4340 | .38-0.43 | 0.65-0.85 | 1.65-2.00 | 0.70-0.90 | .20-.30 | a,b | E4340 |
| **Nickel 1.75%—Molybdenum 0.25% Steels** | | | | | | | |
| 4608 | .06-0.11 | 0.25-0.45 | 1.40-1.75 | ..... | .15-.25 | a,d | 4608 |
| 4615 | .13-0.18 | 0.45-0.65 | 1.65-2.00 | ..... | .20-.30 | a,b | 4615 |
| 4617 | .15-0.20 | 0.45-0.65 | 1.65-2.00 | ..... | .20-.30 | a,b | 4617 |
| 4620 | .17-0.22 | 0.45-0.65 | 1.65-2.00 | ..... | .20-.30 | a,b | 4620 |
| X4620 | .18-0.23 | 0.50-0.70 | 1.65-2.00 | ..... | .20-.30 | a,b | X4620 |
| 4621 | .18-0.23 | 0.70-0.90 | 1.65-2.00 | ..... | .20-.30 | a,b | 4621 |
| 4640 | .38-0.43 | 0.60-0.80 | 1.65-2.00 | ..... | .20-.30 | a,b | 4640 |

* Prefix E denotes electric furnace steel; all others are open hearth steel.
† For open hearth steel the manganese is 0.40 to 0.60%.
(a) *Phosphorus* and *Sulphur* content for basic open hearth steel is .040 max.; for basic electric furnace steel, .025 max.
(b) *Silicon* content is .20 to .35%.
(c) *Phosphorus* content is .040 max.; *sulphur* .035 to .050%.
(d) *Silicon* content is 0.25 max.

# AISI & SAE STANDARD STEEL COMPOSITIONS

## ALLOY STEELS, *Continued*

Open Hearth and Electric Furnace

| AISI No.* | C | Mn | Ni | Cr | Mo | Other Elements | SAE No. |
|---|---|---|---|---|---|---|---|
| **Nickel 1.05%—Chromium 0.45%—Molybdenum 0.20%** | | | | | | | |
| 4720 | .17-0.22 | 0.50-0.70 | 0.90-1.20 | 0.35-0.55 | .15-.25 | a,b | 4720 |
| **Nickel 3.50%—Molybdenum 0.25%** | | | | | | | |
| 4812 | .10-0.15 | 0.40-0.60 | 3.25-3.75 | ..... | .20-.30 | a,b | 4812 |
| 4815 | .13-0.18 | 0.40-0.60 | 3.25-3.75 | ..... | .20-.30 | a,b | 4815 |
| 4817 | .15-0.20 | 0.40-0.60 | 3.25-3.75 | ..... | .20-.30 | a,b | 4817 |
| 4820 | .18-0.23 | 0.50-0.70 | 3.25-3.75 | ..... | .20-.30 | a,b | 4820 |
| **Chromium Steels** | | | | | | | |
| 5015 | .12-0.17 | 0.30-0.50 | ..... | 0.30-0.50 | ..... | a,b | 5015 |
| 5046 | .43-0.50 | 0.75-1.00 | ..... | 0.20-0.35 | ..... | a,b | 5046 |
| 5117 | .15-0.20 | 0.70-0.90 | ..... | 0.70-0.90 | ..... | a,b | 5117 |
| 5120 | .17-0.22 | 0.70-0.90 | ..... | 0.70-0.90 | ..... | a,b | 5120 |
| 5130 | .28-0.33 | 0.70-0.90 | ..... | 0.80-1.10 | ..... | a,b | 5130 |
| 5132 | .30-0.35 | 0.60-0.80 | ..... | 0.75-1.00 | ..... | a,b | 5132 |
| 5135 | .33-0.38 | 0.60-0.80 | ..... | 0.80-1.05 | ..... | a,b | 5135 |
| 5140 | .38-0.43 | 0.70-0.90 | ..... | 0.70-0.90 | ..... | a,b | 5140 |
| 5145 | .43-0.48 | 0.70-0.90 | ..... | 0.70-0.90 | ..... | a,b | 5145 |
| 5147 | .45-0.52 | 0.70-0.95 | ..... | 0.85-1.15 | ..... | a,b | 5147 |
| 5150 | .48-0.53 | 0.70-0.90 | ..... | 0.70-0.90 | ..... | a,b | 5150 |
| 5152 | .48-0.55 | 0.70-0.90 | ..... | 0.90-1.20 | ..... | a,b | 5152 |
| 5155 | .50-0.60 | 0.70-0.90 | ..... | 0.70-0.90 | ..... | a,b | 5155 |
| 5160 | .55-0.65 | 0.75-1.00 | ..... | 0.70-0.90 | ..... | a,b | 5160 |
| E 50100 | .95-1.10 | 0.25-0.45 | ..... | 0.40-0.60 | ..... | a,b | 50100 |
| E 51100 | .95-1.10 | 0.25-0.45 | ..... | 0.90-1.15 | ..... | a,b | 51100 |
| E 52100 | .95-1.10 | 0.25-0.45 | ..... | 1.30-1.60 | ..... | a,b | 52100 |
| **Chromium—Vanadium Steels** | | | | | | | |
| 6117 | .15-0.20 | 0.70-0.90 | ..... | 0.70-0.90 | .10 min. V | a,b | 6117 |
| 6120 | .17-0.22 | 0.70-0.90 | ..... | 0.70-0.90 | .10 min. V | a,b | 6120 |
| 6145 | .43-0.48 | 0.70-0.90 | ..... | 0.80-1.10 | .15 min. V | a,b | 6145 |
| 6150 | .48-0.53 | 0.70-0.90 | ..... | 0.80-1.10 | .15 min. V | a,b | 6150 |
| **Nickel 0.55%—Chromium 0.50%—Molybdenum 0.20%** | | | | | | | |
| 8615 | .13-0.18 | 0.70-0.90 | 0.40-0.70 | 0.40-0.60 | .15-.25 | a,b | 8615 |
| 8617 | .15-0.20 | 0.70-0.90 | 0.40-0.70 | 0.40-0.60 | .15-.25 | a,b | 8617 |
| 8620 | .18-0.23 | 0.70-0.90 | 0.40-0.70 | 0.40-0.60 | .15-.25 | a,b | 8620 |
| 8622 | .20-0.25 | 0.70-0.90 | 0.40-0.70 | 0.40-0.60 | .15-.25 | a,b | 8622 |
| 8625 | .23-0.28 | 0.70-0.90 | 0.40-0.70 | 0.40-0.60 | .15-.25 | a,b | 8625 |
| 8627 | .25-0.30 | 0.70-0.90 | 0.40-0.70 | 0.40-0.60 | .15-.25 | a,b | 8627 |
| 8630 | .28-0.33 | 0.70-0.90 | 0.40-0.70 | 0.40-0.60 | .15-.25 | a,b | 8630 |
| 8635 | .33-0.38 | 0.75-1.00 | 0.40-0.70 | 0.40-0.60 | .15-.25 | a,b | 8635 |
| 8637 | .35-0.40 | 0.75-1.00 | 0.40-0.70 | 0.40-0.60 | .15-.25 | a,b | 8637 |
| 8640 | .38-0.43 | 0.75-1.00 | 0.40-0.70 | 0.40-0.60 | .15-.25 | a,b | 8640 |
| 8641 | .38-0.43 | 0.75-1.00 | 0.40-0.70 | 0.40-0160 | .15-.25 | b,c | 8641 |
| 8642 | .40-0.45 | 0.75-1.00 | 0.40-0.70 | 0.40-0.60 | .15-.25 | a,b | 8642 |
| 8645 | .43-0.48 | 0.75-1.00 | 0.40-0.70 | 0.40-0.60 | .15-.25 | a,b | 8645 |
| 8650 | .48-0.53 | 0.75-1.00 | 0.40-0.70 | 0.40-0.60 | .15-.25 | a,b | 8650 |
| 8653 | .50-0.56 | 0.75-1.00 | 0.40-0.70 | 0.50-0.80 | .15-.25 | a,b | 8653 |
| 8655 | .50-0.60 | 0.75-1.00 | 0.40-0.70 | 0.40-0.60 | .15-.25 | a,b | 8655 |
| 8660 | .55-0.65 | 0.75-1.00 | 0.40-0.70 | 0.40-0.60 | .15-.25 | a,b | 8660 |

* Prefix E denotes electric furnace steel; all others are open hearth steel.

(a) *Phosphorus* and *sulphur* content for basic open hearth steel is .040 max.; for basic electric furnace steel, .025 max.

(b) *Silicon* content is .20 to .35%.

(c) *Phosphorus* content is .040 max.; *sulphur* .040 to .060%.

# AISI & SAE STANDARD STEEL COMPOSITIONS

## ALLOY STEELS, *Continued*

Open Hearth and Electric Furnace

| AISI No.* | C | Mn | Ni | Cr | Mo | Other Elements | SAE No. |
|---|---|---|---|---|---|---|---|
| **Nickel 0.55%—Chromium 0.50%—Molybdenum 0.25%** | | | | | | | |
| 8715 | .13-0.18 | 0.70-0.90 | 0.40-0.70 | 0.40-0.60 | .20-.30 | a,b | 8715 |
| 8717 | .15-0.20 | 0.70-0.90 | 0.40-0.70 | 0.40-0.60 | .20-.30 | a,b | 8717 |
| 8720 | .18-0.23 | 0.70-0.90 | 0.40-0.70 | 0.40-0.60 | .20-.30 | a,b | 8720 |
| 8735 | .33-0.38 | 0.75-1.00 | 0.40-0.70 | 0.40-0.60 | .20-.30 | a,b | ..... |
| 8740 | .38-0.43 | 0.75-1.00 | 0.40-0.70 | 0.40-0.60 | .20-.30 | a,b | 8740 |
| 8742 | .40-0.45 | 0.75-1.00 | 0.40-0.70 | 0.40-0.60 | .20-.30 | a,b | 8742 |
| 8750 | .48-0.53 | 0.75-1.00 | 0.40-0.70 | 0.40-0.60 | .20-.30 | a,b | 8750 |
| **Silicon—Manganese Steels** (*Silicon content is 1.8 to 2.2%*) | | | | | | | |
| 9255 | .50-0.60 | 0.70-0.95 | ..... | ..... | ..... | a | 9255 |
| 9260 | .55-0.65 | 0.70-1.00 | ..... | ..... | ..... | a | 9260 |
| 9261 | .55-0.65 | 0.75-1.00 | ..... | 0.10-0.25 | ..... | a | 9261 |
| 9262 | .55-0.65 | 0.75-1.00 | ..... | 0.25-0.40 | ..... | a | 9262 |
| **Nickel 3.25%—Chromium 1.20%—Molybdenum 0.12%** | | | | | | | |
| E9310 | .08-0.13 | 0.45-0.65 | 3.00-3.50 | 1.00-1.40 | .08-.15 | a,b | 9310 |
| E9314 | .11-0.17 | 0.40-0.70 | 3.00-3.50 | 1.00-1.40 | .08-.15 | a,b | ..... |
| **Nickel 1.00%—Chromium 0.80%—Molybdenum 0.25%** | | | | | | | |
| 9840 | .38-0.43 | 0.70-0.90 | 0.85-1.15 | 0.70-0.90 | .20-.30 | a,b | 9840 |
| 9845 | .43-0.48 | 0.70-0.90 | 0.85-1.15 | 0.70-0.90 | .20-.30 | a,b | ..... |
| 9850 | .48-0.53 | 0.70-0.90 | 0.85-1.15 | 0.70-0.90 | .20-.30 | a,b | 9850 |

* Prefix E denotes electric furnace steel; all others are open hearth steel.

(a) *Phosphorus* and *sulphur* content for basic open hearth steel is .040 max.; for basic electric furnace steel, .025 max.

(b) *Silicon* content is .20 to .35%.

Although most analyses shown above and on the preceding two pages are manufactured by the basic open hearth process, they may be manufactured by the basic electric furnace process with adjustment in phosphorus and sulphur.

# AISI CHEMICAL COMPOSITION LIMITS

## ALLOY STEELS (Revised July, 1955)

Tentative Standard Types

| AISI No. | C | Mn | Si | Ni | Cr | Mo |
|---|---|---|---|---|---|---|
| **Chromium—Molybdenum Steels** | | | | | | |
| TS4130 | .28-.33 | 0.45-0.65 | .20-.35 | ..... | 0.90-1.20 | .08-.15 |
| TS4132 | .30-.35 | 0.45-0.65 | .20-.35 | ..... | 0.90-1.20 | .08-.15 |
| TS4137 | .35-.40 | 0.75-1.00 | .20-.35 | ..... | 0.90-1.20 | .08-.15 |
| TS4140 | .38-.43 | 0.80-1.05 | .20-.35 | ..... | 0.90-1.20 | .08-.15 |
| TS4142 | .40-.45 | 0.80-1.05 | .20-.35 | ..... | 0.90-1.20 | .08-.15 |
| TS4145 | .43-.48 | 0.80-1.05 | .20-.35 | ..... | 0.90-1.20 | .08-.15 |
| TS4150 | .48-.53 | 0.80-1.05 | .20-.35 | ..... | 0.90-1.20 | .08-.15 |
| **Nickel 0.30%—Chromium 0.45%—Molybdenum 0.12% Steels** | | | | | | |
| TS8115 | .13-.18 | 0.70-0.90 | .20-.35 | .20-.40 | 0.30-0.50 | .08-.15 |
| TS8120 | .18-.23 | 0.70-0.90 | .20-.35 | .20-.40 | 0.30-0.50 | .08-.15 |
| TS8122 | .20-.25 | 0.70-0.90 | .20-.35 | .20-.40 | 0.30-0.50 | .08-.15 |
| TS8125 | .23-.28 | 0.70-0.90 | .20-.35 | .20-.40 | 0.30-0.50 | .08-.15 |
| TS8127 | .25-.30 | 0.70-0.90 | .20-.35 | .20-.40 | 0.30-0.50 | .08-.15 |
| **Nickel 0.45%—Chromium 0.65%—Molybdenum 0.12% Steels** | | | | | | |
| TS8615 | .13-.18 | 0.70-0.90 | .20-.35 | .30-.60 | 0.55-0.75 | .08-.15 |
| TS8617 | .15-.20 | 0.70-0.90 | .20-.35 | .30-.60 | 0.55-0.75 | .08-.15 |
| TS8620 | .18-.23 | 0.70-0.90 | .20-.35 | .30-.60 | 0.55-0.75 | .08-.15 |

**Note 1:** Phosphorus and sulphur limitations for each steel making process are: Basic electric furnace—0.025 max.; Basic open hearth—0.04 max.; Acid electric furnace—0.05 max.; Acid open hearth—0.05 max.

**Note 2:** Minimum silicon limit for acid open hearth or acid electric furnace alloy steel is 0 15 per cent.

**Note 3:** Small quantities of certain elements may be found in alloy and electric furnace carbon steels which are not specified or required. These elements are to be considered as incidental and acceptable to the following maximum amounts: Copper, 0.35%; nickel, 0.25%; chromium, 0.20%; molybdenum, 0.06%.

# STANDARD MANUFACTURING TOLERANCES

## COLD FINISHED CARBON STEEL BARS AND SHAFTING

*All Tolerances are Minus*

| Specified Size in Inches | Variations from Size in Inches: Max. Carbon Range .28% or less | Max. Carbon Range Over .28% to .55% incl. | Strain Relieved All Carbons | Max. Carbon Range Over .55% or Heat Treated (All Carbons) |
|---|---|---|---|---|
| **Cold Drawn or Turned & Polished Rounds** | | | | |
| Up to 1 incl | .002 | .003 | .004 | .006 |
| Over 1 to 2, incl. | .003 | .004 | .006 | .008 |
| Over 2 to 4, incl. | .004 | .005 | .008 | .010 |
| Over 4 to 6, incl. | .005 | .006 | .010 | .012 |
| Over 6 to 7¾, incl. | .006 | .008 | .012 | .016 |
| Over 7¾ to 8, incl. | .007 | .010 | .014 | .018 |
| **Cold Drawn Hexagons** | | | | |
| Up to 5/16, incl. | .002 | .003 | .004 | .006 |
| Over 5/16 to 1, incl. | .003 | .004 | .006 | .008 |
| Over 1 to 2½, incl. | .004 | .005 | .008 | .010 |
| Over 2½ to 3⅛, incl. | .005 | .006 | .010 | .012 |
| **Cold Drawn Squares** | | | | |
| Up to 5/16, incl | .003 | .004 | .006 | .008 |
| Over 5/16 to 1, incl. | .004 | .005 | .008 | .010 |
| Over 1 to 2½, incl. | .005 | .006 | .010 | .012 |
| Over 2½ to 4, incl. | .006 | .008 | .012 | .016 |
| **Cold Drawn Flats** | | | | |
| *Tolerances for flats apply to thickness as well as width* | | | | |
| Width in Inches | | | | |
| To ¾ incl. | .003 | .004 | .006 | .008 |
| Over ¾ to 1½, incl. | .004 | .005 | .008 | .010 |
| Over 1½ to 3, incl. | .005 | .006 | .010 | .012 |
| Over 3 to 4, incl. | .006 | .008 | .011 | .016 |
| Over 4 to 6, incl. | .008 | .010 | .012 | .020 |
| Over 6 | .013 | | | |

## Turned, Ground and Polished Rounds
## Cold Drawn, Ground and Polished Rounds

| Diameters | Variations from Size, Inches: Free Machining Grades Sulphur .08 Minimum—Not Furnace Treated All Carbons | Non-Resulphurized Steel Sulphur under .08 or Furnace Treated All Carbons |
|---|---|---|
| Less than 2½" | .002 | .002 |
| 2½" to 4" Incl. | .003 | .003 |
| Over 4" to 6" Incl. | .004 | .005 |
| Over 6" | .005 | .006 |

# STANDARD MANUFACTURING TOLERANCES

## COLD FINISHED ALLOY STEELS • *All tolerances are minus*

### Cold Drawn Bars

| Specified Size in Inches | Variations from Size in Inches: Maximum Carbon Range 0.28% | Max. Carbon Range Over 0.28 to 0.55% incl. or all Carbons to 0.55% Max. Anni'd or Norm. | Maximum Carbon Range Over 0.55% or All Carbons Heat Treated or Stress Relieved |
|---|---|---|---|
| **ROUNDS** | | | |
| Up to 1 incl | 0.003 | 0.005 | 0.007 |
| Over 1 to 2 incl. | 0.004 | 0.006 | 0.009 |
| Over 2 to 4 incl | 0.005 | 0.007 | 0.011 |
| **HEXAGONS** | | | |
| Up to 5/16 incl | 0.003 | 0.005 | 0.007 |
| Over 5/16 to 1 incl. | 0.004 | 0.006 | 0.009 |
| Over 1 to 2 1/2 incl. | 0.005 | 0.007 | 0.011 |
| Over 2 1/2 to 3 1/8 incl | 0.006 | 0.008 | 0.013 |
| **SQUARES** | | | |
| Up to 5/16 incl | 0.004 | 0.006 | 0.009 |
| Over 5/16 to 1 incl. | 0.005 | 0.007 | 0.011 |
| Over 1 to 2 1/2 incl. | 0.006 | 0.008 | 0.013 |
| Over 2 1/2 to 4 incl | 0.007 | 0.010 | 0.017 |

**FLATS** • *Tolerances apply to thickness as well as width*

| Width in Inches | | | |
|---|---|---|---|
| Up to 3/4 incl | 0.004 | 0.006 | 0.009 |
| Over 3/4 to 1 1/2 incl. | 0.005 | 0.007 | 0.011 |
| Over 1 1/2 to 3 incl. | 0.006 | 0.008 | 0.013 |
| Over 3 to 4 incl. | 0.007 | 0.010 | 0.017 |
| Over 4 to 6 incl. | 0.009 | 0.012 | 0.021 |
| Over 6 | 0.014 | | |

### Turned and Polished Rounds

| Specified Size in Inches | Variations from Size in Inches: Maximum Carbon Range 0.28% | Max. Carbon Range Over 0.28 to 0.55% Incl. or all Carbons to 0.55% Max. Anni'd or Norm. | Maximum Carbon Range Over 0.55% or All Carbons Heat Treated or Stress Relieved |
|---|---|---|---|
| Up to 1 incl | 0.003 | 0.005 | 0.007 |
| Over 1 to 2 incl. | 0.004 | 0.006 | 0.009 |
| Over 2 to 4 incl. | 0.005 | 0.007 | 0.011 |
| Over 4 to 6 incl. | 0.006 | 0.008 | 0.013 |
| Over 6 to 7 3/4 incl. | 0.007 | 0.010 | 0.017 |
| Over 7 3/4 to 9 incl | 0.008 | 0.011 | 0.019 |

### Cold Drawn, Ground and Polished or Turned, Ground and Polished Rounds

| Diameter in Inches | Variations from Size in Inches: Not Heat Treated | Heat Treated (Quenched & Drawn) |
|---|---|---|
| Up to 2 1/2, excl. | .002 | .003 |
| 2 1/2 to 4, incl. | .003 | .004 |
| Over 4 to 6, incl. | .004 | .005 |
| Over 6 | .005 | .006 |

## ALLOWANCE FOR MACHINING

When ordering bars that are to be machined, experience has shown it advisable to make adequate allowances for finishing and to specify hot rolled sizes accordingly. These allowances vary with the machining practice, the length and size of bars, straightness, size tolerance and out-of-round tolerance. Bars are generally straightened before turning. The allowances should permit an actual stock removal from the surface of not less than the amounts shown in the table below (e.g., in machining a one inch round, a minimum of 0.046 inch is removed from the diameter).

### HOT ROLLED ALLOY STEEL BARS

AISI Manual dated July, 1955

| Specified Size in Inches | Min. Stock Removal from Surface, Inches | Specified Size in Inches | Min. Stock Removal from Surface, Inches |
|---|---|---|---|
| Up to 5/8 incl. | 0.016 | Over 2 to 2 1/2 incl. | 0.052 |
| Over 5/8 to 7/8 incl. | 0.021 | Over 2 1/2 to 3 1/2 incl. | 0.072 |
| Over 7/8 to 1 incl. | 0.023 | Over 3 1/2 to 4 1/2 incl. | 0.090 |
| Over 1 to 1 1/8 incl. | 0.025 | Over 4 1/2 to 5 1/2 incl. | 0.110 |
| Over 1 1/8 to 1 1/4 incl. | 0.028 | Over 5 1/2 to 6 1/2 incl. | 0.125 |
| Over 1 1/4 to 1 3/8 incl. | 0.030 | Over 6 1/2 to 8 1/4 incl. | 0.155 |
| Over 1 3/8 to 1 1/2 incl. | 0.033 | Over 8 1/4 to 9 1/2 incl. | 0.203 |
| Over 1 1/2 to 2 incl. | 0.042 | | |

### HOT ROLLED TOOL STEEL BARS

| | | | |
|---|---|---|---|
| 1/4 to 1/2 incl. | 0.015 | Over 2 1/2 to 5 incl. | 0.125 |
| Over 1/2 to 1 incl. | 0.030 | Over 5 | 0.187 |
| Over 1 to 2 1/2 incl. | 0.063 | | |

### HOT ROLLED CARBON STEEL BARS

AISI Manual Section 8

| Nominal Diameter of Hot Rolled Bar in Inches | Conventional Allowance for Turning on Diameter |
|---|---|
| 1 1/2 to 3 incl. | 1/8" |
| Over 3 | 1/4" |

Note: Bars are commonly straightened before turning.

## MECHANICAL PROPERTIES IN RELATION TO HARDNESS

These approximate relationships are based on hardness and apply only to fully quenched, or fully quenched and tempered steels. This table will be more accurate for alloys of .30 carbon or higher, because steels with less than .30 carbon usually have yield point values lower than those shown.

| Hardness Rockwell | Hardness Brinell | Tensile Strength psi | Yield Point psi | % Elong. in 2" | % Red. of Area |
|---|---|---|---|---|---|
| 14 | 197 | 93,000/103,000 | 69,000/ 78,000 | 22/28 | 60/68 |
| 16 | 207 | 98,000/108,000 | 73,000/ 84,000 | 21.5/27.5 | 59/67 |
| 18 | 217 | 103,000/114,000 | 76,000/ 90,000 | 21/27.5 | 58/66 |
| 20 | 223 | 106,000/117,000 | 79,000/ 93,000 | 20.5/26.3 | 57.5/65.5 |
| 22 | 235 | 112,000/124,000 | 85,000/ 99,000 | 20/25.5 | 56.5/64.5 |
| 24 | 248 | 118,000/131,000 | 92,000/107,000 | 19.5/24.5 | 55/63 |
| 26 | 262 | 124,000/138,000 | 99,000/114,000 | 18.5/24 | 54/61.5 |
| 28 | 277 | 131,000/146,000 | 107,000/122,000 | 18/22.5 | 52/60 |
| 30 | 293 | 138,000/154,000 | 116,000/131,000 | 17/22 | 51/59 |
| 32 | 311 | 146,000/164,000 | 125,000/141,000 | 16/20.5 | 49/57 |
| 34 | 321 | 151,000/170,000 | 131,000/146,000 | 15.5/20 | 48/56 |
| 36 | 341 | 160,000/180,000 | 141,000/157,000 | 14.5/18.5 | 46/54 |
| 38 | 363 | 171,000/193,000 | 153,000/170,000 | 13.5/17 | 43.5/51.5 |
| 40 | 379 | 178,000/201,000 | 163,000/179,000 | 12.5/16 | 42/50 |
| 42 | 401 | 188,000/222,000 | 176,000/185,000 | 11/15 | 40/49 |

## STEEL HARDNESS CONVERSION NUMBERS

**(Approximate)**

**Based on Rockwell Hardness**

| ROCKWELL | | BRINELL | | | | |
|---|---|---|---|---|---|---|
| C Scale 150 Kg., 120° Cone | B Scale 100 Kg., 1/16" Ball | Hardness No. | Diam. 3000 Kg., 10 mm. Ball | Vickers | Shore Scleroscope | Tensile Strength 1000 Lb./Sq. Inch |
| 68 | ... | ... | ... | 940 | 97 | ... |
| 67 | ... | ... | ... | 900 | 95 | ... |
| 66 | ... | ... | ... | 865 | 92 | ... |
| 65 | ... | 739 | ... | 832 | 91 | ... |
| 64 | ... | 722 | 2.28 | 800 | 88 | ... |
| 63 | ... | 705 | 2.31 | 772 | 87 | ... |
| 62 | ... | 688 | 2.33 | 746 | 85 | ... |
| 61 | ... | 670 | 2.36 | 720 | 83 | ... |
| 60 | ... | 654 | 2.40 | 697 | 81 | ... |
| 59 | ... | 634 | 2.43 | 674 | 80 | 326 |
| 58 | ... | 615 | 2.47 | 653 | 78 | 315 |
| 57 | ... | 595 | 2.51 | 633 | 76 | 305 |
| 56 | ... | 577 | 2.55 | 613 | 75 | 295 |
| 55 | ... | 560 | 2.58 | 595 | 74 | 287 |
| 54 | ... | 543 | 2.63 | 577 | 72 | 278 |
| 53 | ... | 525 | 2.67 | 560 | 71 | 269 |
| 52 | ... | 512 | 2.71 | 544 | 69 | 262 |
| 51 | ... | 496 | 2.75 | 528 | 68 | 253 |
| 50 | ... | 481 | 2.79 | 513 | 67 | 245 |
| 49 | ... | 469 | 2.83 | 498 | 66 | 239 |
| 48 | ... | 455 | 2.87 | 484 | 64 | 232 |
| 47 | ... | 443 | 2.91 | 471 | 63 | 225 |
| 46 | ... | 432 | 2.94 | 458 | 62 | 219 |
| 45 | ... | 421 | 2.98 | 446 | 60 | 212 |
| 44 | ... | 409 | 3.02 | 434 | 58 | 206 |
| 43 | ... | 400 | 3.05 | 423 | 57 | 201 |
| 42 | ... | 390 | 3.09 | 412 | 56 | 196 |
| 41 | ... | 381 | 3.12 | 402 | 55 | 191 |
| 40 | ... | 371 | 3.16 | 392 | 54 | 186 |
| 39 | ... | 362 | 3.19 | 382 | 52 | 181 |
| 38 | ... | 353 | 3.24 | 372 | 51 | 176 |
| 37 | ... | 344 | 3.28 | 363 | 50 | 172 |
| 36 | (109) | 336 | 3.32 | 354 | 49 | 168 |
| 35 | ... | 327 | 3.37 | 345 | 48 | 163 |
| 34 | (108) | 319 | 3.41 | 336 | 47 | 159 |
| 33 | ... | 311 | 3.45 | 327 | 46 | 154 |
| 32 | (107) | 301 | 3.51 | 318 | 44 | 150 |
| 31 | (106) | 294 | 3.54 | 310 | 43 | 146 |
| 30 | ... | 286 | 3.59 | 302 | 42 | 142 |
| 29 | ... | 279 | 3.63 | 294 | 41 | 138 |
| 28 | (104) | 271 | 3.69 | 286 | 41 | 134 |
| 27 | (103) | 264 | 3.74 | 279 | 40 | 131 |
| 26 | ... | 258 | 3.78 | 272 | 38 | 127 |
| 25 | ... | 253 | 3.81 | 266 | 38 | 124 |
| 24 | (101) | 247 | 3.84 | 260 | 37 | 121 |
| 23 | 100 | 243 | 3.88 | 254 | 36 | 118 |
| 22 | 99 | 237 | 3.93 | 248 | 35 | 115 |
| 21 | ... | 231 | 3.98 | 243 | 35 | 113 |
| 20 | 98 | 226 | 4.02 | 238 | 34 | 110 |
| (18) | 97 | 219 | 4.09 | 230 | 33 | 106 |
| (16) | 95 | 212 | 4.15 | 222 | 32 | 102 |
| (14) | 94 | 203 | 4.24 | 213 | 31 | 98 |
| (12) | 92 | 194 | 4.33 | 204 | 29 | 94 |
| (10) | 91 | 187 | 4.42 | 196 | 28 | 90 |
| (8) | 90 | 179 | 4.51 | 188 | 27 | 87 |
| (6) | 87 | 171 | 4.58 | 180 | 26 | 84 |
| (4) | 85 | 165 | 4.67 | 173 | 25 | 80 |
| (2) | 83 | 158 | 4.77 | 166 | 24 | 77 |
| (0) | 82 | 152 | 4.84 | 160 | 24 | 75 |

Values in ( ) are beyond normal range; given for information only.

### COLD ROLLED LOW CARBON SHEETS AND STRIP

| Rockwell B | Brinell | Shore Scleroscope | Rockwell B | Brinell | Shore Scleroscope |
|---|---|---|---|---|---|
| 100 | 216 | 40 | 65 | 106 | 20 |
| 95 | 186 | 35 | 60 | 98 | 19 |
| 90 | 163 | 30 | 55 | 91 | 18 |
| 85 | 147 | 28 | 50 | 84 | 16 |
| 80 | 134 | 26 | 45 | 78 | 15 |
| 75 | 124 | 24 | 40 | 71 | 14 |
| 70 | 115 | 22 | 35 | 65 | 14 |

## NUMBER OF SQUARE FEET IN PLATES

Figures for Square Feet represent number of square feet in a plate 1" *wide*. To secure number of square feet in other widths, multiply this figure by the width in inches.

| Length in Ft. & Inches | Square Inches | Square Feet |
|---|---|---|
| 1 Ft.- 0 | 12 | .0833 |
| 1 | 13 | .0903 |
| 2 | 14 | .0972 |
| 3 | 15 | .1042 |
| 4 | 16 | .1111 |
| 5 | 17 | .1181 |
| 6 | 18 | .1250 |
| 7 | 19 | .1319 |
| 8 | 20 | .1389 |
| 9 | 21 | .1458 |
| 10 | 22 | .1528 |
| 11 | 23 | .1597 |
| 2 Ft.- 0 | 24 | .1667 |
| 1 | 25 | 1736 |
| 2 | 26 | .1806 |
| 3 | 27 | .1875 |
| 4 | 28 | .1944 |
| 5 | 29 | .2014 |
| 6 | 30 | .2083 |
| 7 | 31 | .2153 |
| 8 | 32 | .2222 |
| 9 | 33 | .2292 |
| 10 | 34 | .2361 |
| 11 | 35 | .2431 |
| 3 Ft.- 0 | 36 | .2500 |
| 1 | 37 | .2569 |
| 2 | 38 | .2639 |
| 3 | 39 | .2708 |
| 4 | 40 | .2778 |
| 5 | 41 | .2847 |
| 6 | 42 | .2917 |
| 7 | 43 | .2986 |
| 8 | 44 | .3056 |
| 9 | 45 | .3125 |
| 10 | 46 | .3194 |
| 11 | 47 | .3264 |
| 4 Ft.- 0 | 48 | .3333 |
| 1 | 49 | .3403 |
| 2 | 50 | .3472 |
| 3 | 51 | .3542 |
| 4 | 52 | .3611 |
| 5 | 53 | .3681 |
| 6 | 54 | .3750 |
| 7 | 55 | .3819 |
| 8 | 56 | .3889 |
| 9 | 57 | .3958 |
| 10 | 58 | .4028 |
| 11 | 59 | .4097 |
| 5 Ft.- 0 | 60 | .4167 |
| 1 | 61 | .4236 |
| 2 | 62 | .4306 |
| 3 | 63 | .4375 |
| 4 | 64 | .4444 |
| 5 | 65 | .4514 |
| 6 | 66 | .4583 |
| 7 | 67 | .4653 |
| 8 | 68 | .4722 |
| 9 | 69 | .4792 |
| 5 Ft.-10 | 70 | .4861 |
| 11 | 71 | .4931 |
| 6 Ft.- 0 | 72 | .5000 |
| 1 | 73 | .5069 |
| 2 | 74 | .5139 |
| 3 | 75 | .5208 |
| 4 | 76 | .5278 |
| 5 | 77 | .5347 |
| 6 | 78 | .5417 |
| 7 | 79 | .5486 |
| 8 | 80 | .5556 |
| 9 | 81 | .5625 |
| 10 | 82 | .5694 |
| 11 | 83 | .5764 |
| 7 Ft.- 0 | 84 | .5834 |
| 1 | 85 | .5903 |
| 2 | 86 | .5972 |
| 3 | 87 | .6042 |
| 4 | 88 | .6111 |
| 5 | 89 | .6181 |
| 6 | 90 | .6250 |
| 7 | 91 | .6319 |
| 8 | 92 | .6389 |
| 9 | 93 | .6458 |
| 10 | 94 | .6528 |
| 11 | 95 | .6597 |
| 8 Ft.- 0 | 96 | .6667 |
| 1 | 97 | .6736 |
| 2 | 98 | .6806 |
| 3 | 99 | .6875 |
| 4 | 100 | .6944 |
| 5 | 101 | .7014 |
| 6 | 102 | .7083 |
| 7 | 103 | .7153 |
| 8 | 104 | .7222 |
| 9 | 105 | .7292 |
| 10 | 106 | .7361 |
| 11 | 107 | .7431 |
| 9 Ft.- 0 | 108 | .7500 |
| 1 | 109 | .7569 |
| 2 | 110 | .7639 |
| 3 | 111 | .7708 |
| 4 | 112 | .7778 |
| 5 | 113 | .7847 |
| 6 | 114 | .7917 |
| 7 | 115 | .7986 |
| 8 | 116 | .8056 |
| 9 | 117 | .8125 |
| 10 | 118 | .8194 |
| 11 | 119 | .8264 |
| 10 Ft.- 0 | 120 | .8333 |
| 1 | 121 | .8403 |
| 2 | 122 | .8472 |
| 3 | 123 | .8542 |
| 4 | 124 | .8611 |
| 5 | 125 | .8681 |
| 6 | 126 | .8750 |
| (Cont'd) 7 | 127 | .8819 |

## NUMBER OF SQUARE FEET IN PLATES, *Cont'd*

| Length in Ft. & Inches | Square Inches | Square Feet |
|---|---|---|
| 10 Ft.- 8 | 128 | .8889 |
| 9 | 129 | .8958 |
| 10 | 130 | .9028 |
| 11 | 131 | .9097 |
| 11 Ft.- 0 | 132 | .9167 |
| 1 | 133 | .9236 |
| 2 | 134 | .9306 |
| 3 | 135 | .9375 |
| 4 | 136 | .9444 |
| 5 | 137 | .9514 |
| 6 | 138 | .9583 |
| 7 | 139 | .9653 |
| 8 | 140 | .9722 |
| 9 | 141 | .9792 |
| 10 | 142 | .9861 |
| 11 | 143 | .9931 |
| 12 Ft.- 0 | 144 | 1.0000 |
| 1 | 145 | 1.007 |
| 2 | 146 | 1.014 |
| 3 | 147 | 1.021 |
| 4 | 148 | 1.028 |
| 5 | 149 | 1.035 |
| 6 | 150 | 1.042 |
| 7 | 151 | 1.049 |
| 8 | 152 | 1.056 |
| 9 | 153 | 1.063 |
| 10 | 154 | 1.069 |
| 11 | 155 | 1.076 |
| 13 Ft.- 0 | 156 | 1.083 |
| 1 | 157 | 1.090 |
| 2 | 158 | 1.097 |
| 3 | 159 | 1.104 |
| 4 | 160 | 1.111 |
| 5 | 161 | 1.118 |
| 6 | 162 | 1.125 |
| 7 | 163 | 1.132 |
| 8 | 164 | 1.139 |
| 9 | 165 | 1.146 |
| 10 | 166 | 1.153 |
| 11 | 167 | 1.159 |
| 14 Ft.- 0 | 168 | 1.167 |
| 1 | 169 | 1.174 |
| 2 | 170 | 1.181 |
| 3 | 171 | 1.188 |
| 4 | 172 | 1.194 |
| 5 | 173 | 1.201 |
| 6 | 174 | 1.208 |
| 7 | 175 | 1.215 |
| 8 | 176 | 1.222 |
| 9 | 177 | 1.229 |
| 10 | 178 | 1.236 |
| 11 | 179 | 1.243 |
| 15 Ft.- 0 | 180 | 1.250 |
| 1 | 181 | 1.257 |
| 2 | 182 | 1.264 |
| 3 | 183 | 1.271 |
| 4 | 184 | 1.278 |
| 5 | 185 | 1.285 |
| 6 | 186 | 1.292 |
| 7 | 187 | 1.299 |
| 8 | 188 | 1.306 |
| 9 | 189 | 1.313 |
| 15 Ft.-10 | 190 | 1.319 |
| 11 | 191 | 1.326 |
| 16 Ft.- 0 | 192 | 1.333 |
| 1 | 193 | 1.340 |
| 2 | 194 | 1.347 |
| 3 | 195 | 1.354 |
| 4 | 196 | 1.361 |
| 5 | 197 | 1.368 |
| 6 | 198 | 1.375 |
| 7 | 199 | 1.382 |
| 8 | 200 | 1.389 |
| 9 | 201 | 1.396 |
| 10 | 202 | 1.403 |
| 11 | 203 | 1.410 |
| 17 Ft.- 0 | 204 | 1.417 |
| 1 | 205 | 1.424 |
| 2 | 206 | 1.431 |
| 3 | 207 | 1.438 |
| 4 | 208 | 1.444 |
| 5 | 209 | 1.451 |
| 6 | 210 | 1.458 |
| 7 | 211 | 1.465 |
| 8 | 212 | 1.472 |
| 9 | 213 | 1.479 |
| 10 | 214 | 1.486 |
| 11 | 215 | 1.493 |
| 18 Ft.- 0 | 216 | 1.500 |
| 1 | 217 | 1.507 |
| 2 | 218 | 1.514 |
| 3 | 219 | 1.521 |
| 4 | 220 | 1.528 |
| 5 | 221 | 1.535 |
| 6 | 222 | 1 542 |
| 7 | 223 | 1.549 |
| 8 | 224 | 1.556 |
| 9 | 225 | 1.563 |
| 10 | 226 | 1.569 |
| 11 | 227 | 1.576 |
| 19 Ft.- 0 | 228 | 1.583 |
| 1 | 229 | 1.590 |
| 2 | 230 | 1.597 |
| 3 | 231 | 1.604 |
| 4 | 232 | 1.611 |
| 5 | 233 | 1.618 |
| 6 | 234 | 1.625 |
| 7 | 235 | 1.632 |
| 8 | 236 | 1.639 |
| 9 | 237 | 1.645 |
| 10 | 238 | 1.653 |
| 11 | 239 | 1.659 |
| 20 Ft.- 0 | 240 | 1.667 |
| 1 | 241 | 1.674 |
| 2 | 242 | 1.681 |
| 3 | 243 | 1.688 |
| 4 | 244 | 1.694 |
| 5 | 245 | 1.701 |
| 6 | 246 | 1.708 |
| 7 | 247 | 1.715 |
| 8 | 248 | 1.722 |
| 9 | 249 | 1.729 |
| 10 | 250 | 1.736 |
| 11 | 251 | 1.743 |

# CONVERTING INCHES INTO FEET

| Inches | Dec. of a Ft. | Inches | Dec. of a Ft. | Inches | Dec. of a Ft. |
|---|---|---|---|---|---|
| 1/16 | .005208 | 4 | .333333 | 8 | .666666 |
| 1/8 | .010416 | 1/16 | .338542 | 1/16 | .671875 |
| 3/16 | .015625 | 1/8 | .343750 | 1/8 | .677083 |
| 1/4 | .020833 | 3/16 | .348958 | 3/16 | .682292 |
| 5/16 | .026042 | 1/4 | .354166 | 1/4 | .687500 |
| 3/8 | .031250 | 5/16 | .359375 | 5/16 | .692708 |
| 7/16 | .036458 | 3/8 | .364583 | 3/8 | .697916 |
| 1/2 | .041666 | 7/16 | .369792 | 7/16 | .703125 |
| 9/16 | .046875 | 1/2 | .375000 | 1/2 | .708323 |
| 5/8 | .052083 | 9/16 | .380208 | 9/16 | .713542 |
| 11/16 | .057292 | 5/8 | .385416 | 5/8 | .718750 |
| 3/4 | .062500 | 11/16 | .390625 | 11/16 | .723958 |
| 13/16 | .067708 | 3/4 | .395833 | 3/4 | .729166 |
| 7/8 | .072916 | 13/16 | .401042 | 13/16 | .734375 |
| 15/16 | .078125 | 7/8 | .406250 | 7/8 | .739583 |
| 1 | .083333 | 15/16 | .411458 | 15/16 | .744792 |
| 1/16 | .088542 | 5 | .416666 | 9 | .750 |
| 1/8 | .093750 | 1/16 | .421875 | 1/16 | .755208 |
| 3/16 | .098958 | 1/8 | .427083 | 1/8 | .760416 |
| 1/4 | .104166 | 3/16 | .432292 | 3/16 | .765625 |
| 5/16 | .109375 | 1/4 | .437500 | 1/4 | .770833 |
| 3/8 | .114583 | 5/16 | .442708 | 5/16 | .776042 |
| 7/16 | .119792 | 3/8 | .447916 | 3/8 | .781250 |
| 1/2 | .125000 | 7/16 | .453125 | 7/16 | .786458 |
| 9/16 | .130208 | 1/2 | .458333 | 1/2 | .791666 |
| 5/8 | .135416 | 9/16 | .463542 | 9/16 | .796875 |
| 11/16 | .140625 | 5/8 | .468750 | 5/8 | .802083 |
| 3/4 | .145833 | 11/16 | .473958 | 11/16 | .807292 |
| 13/16 | .151042 | 3/4 | .479166 | 3/4 | .812500 |
| 7/8 | .156250 | 13/16 | .484375 | 13/16 | .817708 |
| 15/16 | .161458 | 7/8 | .489583 | 7/8 | .822916 |
| 2 | .166666 | 15/16 | .494792 | 15/16 | .828125 |
| 1/16 | .171875 | 6 | .50 | 10 | .833333 |
| 1/8 | .177083 | 1/16 | .505208 | 1/16 | .838542 |
| 3/16 | .182292 | 1/8 | .510416 | 1/8 | .843750 |
| 1/4 | .187500 | 3/16 | .515625 | 3/16 | .848958 |
| 5/16 | .192708 | 1/4 | .520833 | 1/4 | .854166 |
| 3/8 | .197906 | 5/16 | .526042 | 5/16 | .859375 |
| 7/16 | .203175 | 3/8 | .531250 | 3/8 | .864583 |
| 1/2 | .208333 | 7/16 | .536458 | 7/16 | .869792 |
| 9/16 | .213542 | 1/2 | .541666 | 1/2 | .875000 |
| 5/8 | .218750 | 9/16 | .546875 | 9/16 | .880208 |
| 11/16 | .223958 | 5/8 | .552083 | 5/8 | .885416 |
| 3/4 | .229166 | 11/16 | .557292 | 11/16 | .890625 |
| 13/16 | .234375 | 3/4 | .562500 | 3/4 | .895833 |
| 7/8 | .239583 | 13/16 | .567708 | 13/16 | .901042 |
| 15/16 | .244792 | 7/8 | .572916 | 7/8 | .906250 |
| 3 | .250 | 15/16 | .578125 | 15/16 | .911458 |
| 1/16 | .255208 | 7 | .583333 | 11 | .916666 |
| 1/8 | .260416 | 1/16 | .588542 | 1/16 | .921875 |
| 3/16 | .265625 | 1/8 | .593750 | 1/8 | .927083 |
| 1/4 | .270833 | 3/16 | .598958 | 3/16 | .932292 |
| 5/16 | .276042 | 1/4 | .604166 | 1/4 | .937500 |
| 3/8 | .281250 | 5/16 | .609375 | 5/16 | .942708 |
| 7/16 | .286458 | 3/8 | .614583 | 3/8 | .947916 |
| 1/2 | .291666 | 7/16 | .619792 | 7/16 | .953125 |
| 9/16 | .296875 | 1/2 | .625000 | 1/2 | .958333 |
| 5/8 | .302083 | 9/16 | .630208 | 9/16 | .963542 |
| 11/16 | .307292 | 5/8 | .635416 | 5/8 | .968750 |
| 3/4 | .312500 | 11/16 | .640625 | 11/16 | .973958 |
| 13/16 | .317708 | 3/4 | .645833 | 3/4 | .979166 |
| 7/8 | .322916 | 13/16 | .651042 | 13/16 | .984375 |
| 15/16 | .328125 | 7/8 | .656250 | 7/8 | .989583 |
| | | 15/16 | .661458 | 15/16 | .994792 |

# TEMPERATURE CONVERSION TABLE

The numbers in the second column of each section refer to the temperature in degrees Centigrade or Fahrenheit. If converting from Fahrenheit to Centigrade the equivalent temperature will be found in the left column, from Centigrade to Fahrenheit the right column. These Albert Sauveur temperature conversion tables are reproduced through the courtesy of University Press, Inc.

| −60° to +59° | | | 60° to 330° | | | 340° to 990° | | |
|---|---|---|---|---|---|---|---|---|
| C | | F | C | | F | C | | F |
| −51 | −60 | −76 | 15.6 | 60 | 140.0 | 171 | 340 | 644 |
| −46 | −50 | −58 | 16.1 | 61 | 141.8 | 177 | 350 | 662 |
| −40 | −40 | −40 | 16.6 | 62 | 143.6 | 182 | 360 | 680 |
| −34 | −30 | −22 | 17.1 | 63 | 145.4 | 188 | 370 | 698 |
| −29 | −20 | − 4 | 17.7 | 64 | 147.2 | 193 | 380 | 716 |
| −23 | −10 | 14 | 18.2 | 65 | 149.0 | 199 | 390 | 734 |
| −17.7 | 0 | 32.0 | 18.8 | 66 | 150.8 | 204 | 400 | 752 |
| −17.2 | 1 | 33.8 | 19.3 | 67 | 152.6 | 210 | 410 | 770 |
| −16.6 | 2 | 35.6 | 19.9 | 68 | 154.4 | 215 | 420 | 788 |
| −16.1 | 3 | 37.4 | 20.4 | 69 | 156.2 | 221 | 430 | 806 |
| −15.5 | 4 | 39.2 | 21.0 | 70 | 158.0 | 226 | 440 | 824 |
| −15.0 | 5 | 41.0 | 21.5 | 71 | 159.8 | 232 | 450 | 842 |
| −14.4 | 6 | 42.8 | 22.2 | 72 | 161.6 | 238 | 460 | 860 |
| −13.9 | 7 | 44.6 | 22.7 | 73 | 163.4 | 243 | 470 | 878 |
| −13.3 | 8 | 46.4 | 23.3 | 74 | 165.2 | 249 | 480 | 896 |
| −12.7 | 9 | 48.2 | 23.8 | 75 | 167.0 | 254 | 490 | 914 |
| −12.2 | 10 | 50.0 | 24.4 | 76 | 168.8 | 260 | 500 | 932 |
| −11.6 | 11 | 51.8 | 25.0 | 77 | 170.6 | 265 | 510 | 950 |
| −11.1 | 12 | 53.6 | 25.5 | 78 | 172.4 | 271 | 520 | 968 |
| −10.5 | 13 | 55.4 | 26.2 | 79 | 174.2 | 276 | 530 | 986 |
| −10.0 | 14 | 57.2 | 26.8 | 80 | 176.0 | 282 | 540 | 1004 |
| − 9.4 | 15 | 59.0 | 27.3 | 81 | 177.8 | 288 | 550 | 1022 |
| − 8.8 | 16 | 60.8 | 27.7 | 82 | 179.6 | 293 | 560 | 1040 |
| − 8.3 | 17 | 62.6 | 28.2 | 83 | 181.4 | 299 | 570 | 1058 |
| − 7.7 | 18 | 64.4 | 28.8 | 84 | 183.2 | 304 | 580 | 1076 |
| − 7.2 | 19 | 66.2 | 29.3 | 85 | 185.0 | 310 | 590 | 1094 |
| − 6.6 | 20 | 68.0 | 29.9 | 86 | 186.8 | 315 | 600 | 1112 |
| − 6.1 | 21 | 69.8 | 30.4 | 87 | 188.6 | 321 | 610 | 1130 |
| − 5.5 | 22 | 71.6 | 31.0 | 88 | 190.4 | 326 | 620 | 1148 |
| − 5.0 | 23 | 73.4 | 31.5 | 89 | 192.2 | 332 | 630 | 1166 |
| − 4.4 | 24 | 75.2 | 32.1 | 90 | 194.0 | 338 | 640 | 1184 |
| − 3.9 | 25 | 77.0 | 32.6 | 91 | 195.8 | 343 | 650 | 1202 |
| − 3.3 | 26 | 78.8 | 33.3 | 92 | 197.6 | 349 | 660 | 1220 |
| − 2.8 | 27 | 80.6 | 33.8 | 93 | 199.4 | 354 | 670 | 1238 |
| − 2.2 | 28 | 82.4 | 34.4 | 94 | 201.2 | 360 | 680 | 1256 |
| − 1.6 | 29 | 84.2 | 34.9 | 95 | 203.0 | 365 | 690 | 1274 |
| − 1.1 | 30 | 86.0 | 35.5 | 96 | 204.8 | 371 | 700 | 1292 |
| − 0.6 | 31 | 87.8 | 36.1 | 97 | 206.6 | 376 | 710 | 1310 |
| 0.0 | 32 | 89.6 | 36.6 | 98 | 208.4 | 382 | 720 | 1328 |
| 0.5 | 33 | 91.4 | 37.1 | 99 | 210.2 | 387 | 730 | 1346 |
| 1.1 | 34 | 93.2 | 37.7 | 100 | 212.0 | 393 | 740 | 1364 |
| 1.6 | 35 | 95.0 | 43 | 110 | 230 | 399 | 750 | 1382 |
| 2.2 | 36 | 96.8 | 49 | 120 | 248 | 404 | 760 | 1400 |
| 2.7 | 37 | 98.6 | 54 | 130 | 266 | 410 | 770 | 1418 |
| 3.3 | 38 | 100.4 | 60 | 140 | 284 | 415 | 780 | 1436 |
| 3.8 | 39 | 102.2 | 65 | 150 | 302 | 421 | 790 | 1454 |
| 4.4 | 40 | 104.0 | 71 | 160 | 320 | 426 | 800 | 1472 |
| 4.9 | 41 | 105.8 | 76 | 170 | 338 | 432 | 810 | 1490 |
| 5.5 | 42 | 107.6 | 83 | 180 | 356 | 438 | 820 | 1508 |
| 6.0 | 43 | 109.4 | 88 | 190 | 374 | 443 | 830 | 1526 |
| 6.6 | 44 | 111.2 | 93 | 200 | 392 | 449 | 840 | 1544 |
| 7.1 | 45 | 113.0 | 99 | 210 | 410 | 454 | 850 | 1562 |
| 7.7 | 46 | 114.8 | 100 | 212 | 413 | 460 | 860 | 1580 |
| 8.2 | 47 | 116.6 | 104 | 220 | 428 | 465 | 870 | 1598 |
| 8.8 | 48 | 118.4 | 110 | 230 | 446 | 471 | 880 | 1616 |
| 9.3 | 49 | 120.2 | 115 | 240 | 464 | 476 | 890 | 1634 |
| 9.9 | 50 | 122.0 | 121 | 250 | 482 | 482 | 900 | 1652 |
| 10.4 | 51 | 123.8 | 127 | 260 | 500 | 487 | 910 | 1670 |
| 11.1 | 52 | 125.6 | 132 | 270 | 518 | 493 | 920 | 1688 |
| 11.5 | 53 | 127.4 | 138 | 280 | 536 | 498 | 930 | 1706 |
| 12.1 | 54 | 129.2 | 143 | 290 | 554 | 504 | 940 | 1724 |
| 12.6 | 55 | 131.0 | 149 | 300 | 572 | 510 | 950 | 1742 |
| 13.2 | 56 | 132.8 | 154 | 310 | 590 | 515 | 960 | 1760 |
| 13.7 | 57 | 134.6 | 160 | 320 | 608 | 520 | 970 | 1778 |
| 14.3 | 58 | 136.4 | 165 | 330 | 626 | 526 | 980 | 1796 |
| 14.8 | 59 | 138.2 | | | | 532 | 990 | 1814 |

# TEMPERATURE CONVERSION TABLE

***(Continued)***

| 1000° to 1660° | | | 1670° to 2330° | | | 2340° to 3000° | | |
|---|---|---|---|---|---|---|---|---|
| C | | F | C | | F | C | | F |
| 538 | 1000 | 1832 | 909 | 1670 | 3038 | 1281 | 2340 | 4244 |
| 543 | 1010 | 1850 | 915 | 1680 | 3056 | 1286 | 2350 | 4262 |
| 549 | 1020 | 1868 | 920 | 1690 | 3074 | 1292 | 2360 | 4280 |
| 554 | 1030 | 1886 | 926 | 1700 | 3092 | 1297 | 2370 | 4298 |
| 560 | 1040 | 1904 | 931 | 1710 | 3110 | 1303 | 2380 | 4316 |
| 565 | 1050 | 1922 | 937 | 1720 | 3128 | 1308 | 2390 | 4334 |
| 571 | 1060 | 1940 | 942 | 1730 | 3146 | 1315 | 2400 | 4352 |
| 576 | 1070 | 1958 | 948 | 1740 | 3164 | 1320 | 2410 | 4370 |
| 582 | 1080 | 1976 | 953 | 1750 | 3182 | 1326 | 2420 | 4388 |
| 587 | 1090 | 1994 | 959 | 1760 | 3200 | 1331 | 2430 | 4406 |
| 593 | 1100 | 2012 | 964 | 1770 | 3218 | 1337 | 2440 | 4424 |
| 598 | 1110 | 2030 | 970 | 1780 | 3236 | 1342 | 2450 | 4442 |
| 604 | 1120 | 2048 | 975 | 1790 | 3254 | 1348 | 2460 | 4460 |
| 609 | 1130 | 2066 | 981 | 1800 | 3272 | 1353 | 2470 | 4478 |
| 615 | 1140 | 2084 | 986 | 1810 | 3290 | 1359 | 2480 | 4496 |
| 620 | 1150 | 2102 | 992 | 1820 | 3308 | 1364 | 2490 | 4514 |
| 626 | 1160 | 2120 | 997 | 1830 | 3326 | 1371 | 2500 | 4532 |
| 631 | 1170 | 2138 | 1003 | 1840 | 3344 | 1376 | 2510 | 4550 |
| 637 | 1180 | 2156 | 1008 | 1850 | 3362 | 1382 | 2520 | 4568 |
| 642 | 1190 | 2174 | 1014 | 1860 | 3380 | 1387 | 2530 | 4586 |
| 648 | 1200 | 2192 | 1019 | 1870 | 3398 | 1393 | 2540 | 4604 |
| 653 | 1210 | 2210 | 1025 | 1880 | 3416 | 1398 | 2550 | 4622 |
| 659 | 1220 | 2228 | 1030 | 1890 | 3434 | 1404 | 2560 | 4640 |
| 664 | 1230 | 2246 | 1036 | 1900 | 3452 | 1409 | 2570 | 4658 |
| 670 | 1240 | 2264 | 1041 | 1910 | 3470 | 1415 | 2580 | 4676 |
| 675 | 1250 | 2282 | 1047 | 1920 | 3488 | 1420 | 2590 | 4694 |
| 681 | 1260 | 2300 | 1052 | 1930 | 3506 | 1427 | 2600 | 4712 |
| 686 | 1270 | 2318 | 1058 | 1940 | 3524 | 1432 | 2610 | 4730 |
| 692 | 1280 | 2336 | 1063 | 1950 | 3542 | 1438 | 2620 | 4748 |
| 697 | 1290 | 2354 | 1069 | 1960 | 3560 | 1443 | 2630 | 4766 |
| 704 | 1300 | 2372 | 1074 | 1970 | 3578 | 1449 | 2640 | 4784 |
| 708 | 1310 | 2390 | 1080 | 1980 | 3596 | 1454 | 2650 | 4802 |
| 715 | 1320 | 2408 | 1085 | 1990 | 3614 | 1460 | 2660 | 4820 |
| 719 | 1330 | 2426 | 1093 | 2000 | 3632 | 1465 | 2670 | 4838 |
| 726 | 1340 | 2444 | 1098 | 2010 | 3650 | 1471 | 2680 | 4856 |
| 734 | 1350 | 2462 | 1104 | 2020 | 3668 | 1476 | 2690 | 4874 |
| 737 | 1360 | 2480 | 1109 | 2030 | 3686 | 1483 | 2700 | 4892 |
| 741 | 1370 | 2498 | 1115 | 2040 | 3704 | 1488 | 2710 | 4910 |
| 748 | 1380 | 2516 | 1120 | 2050 | 3722 | 1494 | 2720 | 4928 |
| 752 | 1390 | 2534 | 1126 | 2060 | 3740 | 1499 | 2730 | 4946 |
| 760 | 1400 | 2552 | 1131 | 2070 | 3758 | 1505 | 2740 | 4964 |
| 765 | 1410 | 2570 | 1137 | 2080 | 3776 | 1510 | 2750 | 4982 |
| 771 | 1420 | 2588 | 1142 | 2090 | 3794 | 1516 | 2760 | 5000 |
| 776 | 1430 | 2606 | 1149 | 2100 | 3812 | 1521 | 2770 | 5018 |
| 782 | 1440 | 2624 | 1154 | 2110 | 3830 | 1527 | 2780 | 5036 |
| 787 | 1450 | 2642 | 1160 | 2120 | 3848 | 1532 | 2790 | 5054 |
| 793 | 1460 | 2660 | 1165 | 2130 | 3866 | 1538 | 2800 | 5072 |
| 798 | 1470 | 2578 | 1171 | 2140 | 3884 | 1543 | 2810 | 5090 |
| 804 | 1480 | 2696 | 1176 | 2150 | 3902 | 1549 | 2820 | 5108 |
| 809 | 1490 | 2714 | 1182 | 2160 | 3920 | 1554 | 2830 | 5126 |
| 815 | 1500 | 2732 | 1187 | 2170 | 3938 | 1560 | 2840 | 5144 |
| 820 | 1510 | 2750 | 1193 | 2180 | 3956 | 1565 | 2850 | 5162 |
| 827 | 1520 | 2768 | 1198 | 2190 | 3974 | 1571 | 2860 | 5180 |
| 831 | 1530 | 2786 | 1204 | 2200 | 3992 | 1576 | 2870 | 5198 |
| 838 | 1540 | 2804 | 1209 | 2210 | 4010 | 1582 | 2880 | 5216 |
| 842 | 1550 | 2822 | 1215 | 2220 | 4028 | 1587 | 2890 | 5234 |
| 849 | 1560 | 2840 | 1220 | 2230 | 4046 | 1593 | 2900 | 5252 |
| 853 | 1570 | 2858 | 1226 | 2240 | 4064 | 1598 | 2910 | 5270 |
| 860 | 1580 | 2876 | 1231 | 2250 | 4082 | 1604 | 2920 | 5288 |
| 864 | 1590 | 2894 | 1237 | 2260 | 4100 | 1609 | 2930 | 5306 |
| 871 | 1600 | 2912 | 1242 | 2270 | 4118 | 1615 | 2940 | 5324 |
| 876 | 1610 | 2930 | 1248 | 2280 | 4136 | 1620 | 2950 | 5342 |
| 882 | 1620 | 2948 | 1253 | 2290 | 4154 | 1626 | 2960 | 5360 |
| 887 | 1630 | 2966 | 1259 | 2300 | 4172 | 1631 | 2970 | 5378 |
| 893 | 1640 | 2984 | 1264 | 2310 | 4190 | 1637 | 2980 | 5396 |
| 898 | 1650 | 3002 | 1270 | 2320 | 4208 | 1642 | 2990 | 5414 |
| 904 | 1660 | 3020 | 1275 | 2330 | 4226 | 1649 | 3000 | 5432 |

## GENERAL CONDITIONS AND TERMS OF SALE

For your information, our general conditions and terms which apply to all quotations, acceptance of orders, and shipping practices are listed here. If you have a question not covered by this information, please call or write us.

**Prices**—All material will be billed at our published prices in effect at the time of shipment unless another price was previously quoted or agreed upon. If we have quoted a delivered price, any increase or decrease in transportation charges shall be reflected in our invoice price, and except as otherwise provided in our quotations, we shall be responsible only for such transportation or service charges as are included in the applicable tariff freight rate.

**Terms of Payment**—Each individual invoice shows the payment terms that apply. All invoices are due on a net basis thirty days after date of invoice. The great majority of our products are subject to ½ of 1% discount for cash in ten days. On some commodities we allow 1% or 2% discount and there are a few that are sold on a net or no discount basis.

**Credit Approval**—Our acceptance and/or performance shall at all times be subject to the approval of our Credit Department.

**Performance**—All shipping promises are made with the expectation that shipment will go forward as specified. However, fulfillment is always subject to availability of material and to conditions affecting shipment that are beyond our control. We shall be excused for any delay in performance due to Acts of God, war, revolutions, strikes, riots, lockouts, fires, flood or any other contingency beyond our reasonable control.

**Confirmation of Orders**—Under normal conditions, warehouse stocked material is shipped the same day or the next day after your order is received. For this reason our telephone salesmen check very carefully with you to make sure your order is entered correctly. Since shipments will in most cases be made before your confirming order is received, you must assume the risk involved in possible errors. When you confirm telephone orders in writing you should be sure to clearly mark the orders "confirming," preferably across the face of the order, to avoid possibility of duplication. This will eliminate the inconvenience and expense involved in duplicate shipments.

**Inspection**—All of our material is carefully inspected before it is stocked in our warehouse and again before we ship it to a customer. Our inspectors are all trained and experienced steel men. In spite of the precautions that we take, it is sometimes impossible to detect all imperfections. Upon receipt of material you should inspect it carefully. If it does not appear to be in conformity with your specifications, or if the material appears to be defective, you should immediately notify us and give us a reasonable opportunity to inspect the material. If our inspection shows the material to be defective or not in conformity with your specifications, we will replace such material at the original point of delivery. No material should be returned without our consent. We will furnish instructions for the disposition of rejected material and we will pay any transportation charges involved.

**Claims**—We guarantee to replace any material that is defective within a reasonable time, provided that it has been properly worked or used. Such material will be replaced or credit will be allowed for the price thereof upon its return, but no material may be returned except upon our authorization. If any material proves defective or not in conformity with your specifications, your sole remedy will be to secure replacement of such material. Under no circumstances will we be liable for any claims for labor or consequential damage.

# GENERAL CONDITIONS AND TERMS OF SALE

*(Continued)*

**Boxing Small Pieces and Broken Lots**—Occasionally, customers order a large number of very small pieces of material not normally boxed for shipment. However, if for reasons of security in shipment we find it necessary to pack small pieces in containers (boxes, barrels, drums), a nominal charge is made based on the actual cost of the container and labor.

**Materials for Boiler Construction**—In the construction of boilers and pressure vessels, Federal laws and some State laws require certain chemical and physical test reports on the material used and the stamping of boiler plates, heads and accessories with the maker's name and identification marks. If boiler construction material is to comply with any of these specifications, such information should be furnished with your order. We do not assume any responsibility other than replacing material that does not conform to legal requirements for the construction of a boiler or pressure vessel.

**Claims Against Common Carriers**—Here are some suggestions that will be helpful to you if a shipment should arrive in damaged condition, or if you should discover a shortage. First, show a notation of damage or shortage on the receipt that you give the carrier or his representative, and second, request the carrier's representative to show a similar notation on the freight bill. Failure to do this will destroy the legal basis for a claim because the carrier will then be in possession of a clear delivery receipt. Do not unload the damaged material until the carrier's representative has inspected and noted the damage. If a shortage occurs in a shipment, make an immediate report to the carrier's agent and be sure to confirm it in writing. All claims against common carriers should be presented within nine (9) months from the date of shipment. Do not delay, however, in filing a claim.

**Cancellation**—Orders cannot be cancelled or modified except with our consent and subject to conditions to be agreed upon, which shall include protection of our company against all loss.

**Crating Sheets**—Certain types of sheets have a fine finish, or a degree of flatness, which must be protected while in transit. Even a slight surface defect caused by handling may render the sheets unfit for use. For this reason it is our standard practice to crate all Stretcher Leveled, Long Terne, and Galvannealed Sheets which are Stretcher Leveled, when ordered in lots under 3000 lbs. Only if we are specifically instructed not to crate will we ship the foregoing qualities of sheets in lots under 3000 lbs. without crating. We will not assume any responsibility for damage to such uncrated sheets caused by handling or shipping. The standard charges for crating will be quoted on request. Crating costs may be avoided on large lots which can be satisfactorily packed in skidded bundles for rail shipment to a destination having through package car service; or when single line truck service permits shipment of the sheets to your plant on the same truck making the pick-up.

**Protection of Cold Finished Bars**—To protect the fine finish on our Ground & Polished Accuracy Stock and our Turned, Ground & Polished Shafting, we pack such material in boxes or cardboard tubular containers when shipped by rail, truck, or express. The Railway Express Agency's Classification also provides that oiled or greased bars must be boxed or wrapped the entire length. The standard charges for these containers will be quoted on request.

**Protecting Tubing**—We make no charge for protecting seamless or welded tubes with small diameters or light walls when there is danger of damage in transit. Such sizes include all diameters with wall thickness of No. 16 gauge and lighter and all diameters under ½" O.D. regardless of wall thickness. Other sizes are shipped without protection. If you request that heavier wall sizes be protected by boxing or packing, a charge is made based on our actual cost.

## RYERSON STEEL COLOR CODE

### WHAT THE COLORS STAND FOR

Each color has a definite meaning in our new system for color identification of steel. Here's how the system works:

1. Single colors are reserved for Carbon and Carbon-Manganese steels.
2. The colors Green, Blue, Yellow and Pink always define carbon content.
3. Centered dots of these carbon colors indicate the heat treated condition.
4. Other dots identify additional characteristics.
5. Red means Special Ground Finish.
6. Other colors designate related groups of steel.

The key to this color system is indicated below, and the specific colors for each type of steel in Ryerson stock are shown in the tables on the following page.

### KEY TO COLOR SYSTEM

***Carbon Steel Bars***

| | | | |
|---|---|---|---|
| GREEN | ● | C1018 • C1020 | |
| BLUE | ● | C1035 | ◉ Heat Treated |
| YELLOW | ● | C1042 • C1045 | ◉ Heat Treated |
| PINK | ● | C1095 | ◉ Heat Treated |
| PURPLE | ● | Ledloy (Solid Purple) | |
| | ◉ | Lead Added (Purple Dot) | |
| WHITE | ● | C1212 • B1112 | |
| ORANGE | ● | C1213 • B1113 | |
| GOLD | ● | Low Carbon — High Manganese | |
| BROWN | ● | Med. Carbon — High Manganese | |
| RED | ● | C1213 Accuracy Stock (Solid Red) | |
| | ◐ | Special Ground Finish (Half Red) | |

***Alloy Steel Bars***

| | | | |
|---|---|---|---|
| GREEN | ◑ | Under .30 Carbon | |
| BLUE | ◑ | .30 to under .40 Carbon | ◉ Heat Treated |
| YELLOW | ◑ | .40 to under .50 Carbon | ◉ Heat Treated |
| PINK | ◑ | .50 Carbon and over | ◉ Heat Treated |
| PURPLE | ◐ | Rycut Series/Leaded | |
| BLACK | ◐ | 4100 Series | |
| WHITE | ◐ | 4300 and 4600 Series | |
| ORANGE | ◐ | 8600 and 8700 Series | |
| GOLD | ◐ | 6100 and 9300 Series | |
| RED | ◐ | Special Ground Finish | |

# RYERSON IDENTIFICATION COLORS

## CARBON STEELS

| AISI—Type No., or Analysis | Color Mark |
|---|---|
| C1018 | Green |
| C1020 | Green |
| C1035 | Blue |
| C1040 | Yellow |
| C1042 | Yellow |
| C1045 | Yellow |
| C1095 | Pink |
| B1112, C1212 | White |
| B1113, C1213 | Orange |
| Ledloy | Purple |
| C1117 | Gold |
| Leaded C1117 | Gold with Purple Dot |
| C1137 | Brown & Blue |
| C1141 | Brown |
| C1141 T.G.&P./Accy | Brown & Red |
| C1141 H.T. | Brown with Yellow Dot |
| Ryco 44: | Brown and Yellow with Black Dot |
| Stressproof | Brown & Yellow |

## ALLOY STEELS

| | |
|---|---|
| 4130 A.Q. Strip; Sheets & Plate: Annl'd — Black & Blue | E8740 A.Q. Annl'd — Orange & Yellow |
| Norm. Black & Blue with White Stripe | E 9310 A.Q. — Gold & Green |
| E4130 A.Q. Bars: Annl'd — Black & Blue | N.'Krome "M" — White with Yellow Dot |
| Norm. — Black & Blue with White Dot | Nitralloy — Blue with Yellow Dot |
| N. & T. Black&Blue with Orange Dot | Ryax — Brown with Yellow Dot |
| H.T. — Black with Blue Dot | Rycase — Gold |
| E4140 A.Q. Bars: Annl'd.Black & Yellow with Orange Dot | Leaded Rycase — Gold with Purple Dot |
| Norm. Black & Yellow with White Dot | Ryco 44 — Brown & Yellow with Black Dot |
| 4140-42 Annl'd — Black & Yellow | Rycrome — Black with Yellow Dot |
| 4140 H.T. — Black with Yellow Dot | Rycrome T.G.&P. — Black & Red with Yellow Dot |
| 4140 H.T., T.G.&P. — Black & Red with Yellow Dot | Rycut 20 — Purple & Green |
| Leaded 4140: Annl'd — Purple & Yellow | Rycut 40: Annl'd — Purple & Yellow |
| H.T. — Purple with Yellow Dot | H.T. — Purple with Yellow Dot |
| E 4340 A.Q. Annl'd. — White & Yellow with Black Dot | Rycut 47 Annl'd — Purple & Yellow with Orange Dot |
| 4340 Annl'd — White & Yellow | New Rycut 50: Annl'd — Purple & Pink |
| 4340 H.T. — White with Yellow Dot | H.T. — Purple with Pink Dot |
| 4615-20 — White & Green | Rycut 50: Annl'd. Purple & Pink with Black Dot |
| E 6150 — Gold & Pink | H.T. — Purple & Black with Pink Dot |
| E 8615 — Orange & Green-White Dot | Rytense — Brown |
| 8617-20 — Orange & Green | Rytense T.G.&P./Accy — Brown & Red |
| Leaded 8620 — Purple & Green | Stressproof — Brown & Yellow |

## STAINLESS STEELS

| | |
|---|---|
| 302 — Yellow | 321 — Orange |
| 303 — Black | 347 — Pink |
| 304 — Green | 410 (Plates) — Blue |
| 304L — Gold | 416 (Bars) — Blue |
| 309 — Brown | 416 H.T. — Red & Blue |
| 310 — Red | 430 (Plates) — White |
| 316 — Purple | 430F — Dark Gray |
| 316L — Purple & White | 440C (Bars) — White |

## TOOL STEELS

| | |
|---|---|
| Ry-Alloy — Red—Full Length | V.D. Chisel — Black—Full Length |
| V.D. — Black—Full Length | Non-Tempering — Black & Yellow |

## C. F. BARS—Special Finish

| | |
|---|---|
| G & P C1018 — Red & Green | TG & P C1141 — Red & Brown |
| TG & P C1018 — Red & Green | G & P Accuracy: |
| TG & P C1025 — Red & Green | B1112, C1212 — Red |
| TG & P C1040 — Red & Yellow | B1113, C1213 — Red |
| TG & P C1045 — Red & Yellow | C1141 — Red & Brown |

## PLATES—Special Analyses

| | |
|---|---|
| Abrasion Resisting: Full Hard — Aluminum & Pink | E-Z Cut — Gold |
| Medium Hard — Aluminum | High Carbon E-Z Cut — Brown |
| High Carbon — Yellow | New E-Z Cut — Purple |
| High Strength, Low Alloy — White | New High Carbon E-Z Cut — Purple & Yellow |
| E 8615 — Orange & Green | |

## STANDARD SHEET GAUGES and WEIGHTS

*To avoid errors specify thickness by decimal part of an inch, or by number and name of gauge.*

| Ga. No. | Carbon Sheets (To USS or Mfrs. ga.) Thickness in Inches | Carbon Sheets (To USS or Mfrs. ga.) Weight per sq. Ft. in Lbs. | Galv. Sheets (To galv. sht. ga.) Weight per Sq. Ft. in Lbs. | Stainless Sheets (To Stainless Sheet Gauge) Thickness in Inches | Stainless Sheets Wt. per Sq. Ft. in Lbs. Straight Chrome | Stainless Sheets Wt. per Sq. Ft. in Lbs. Chrome Nickel |
|---|---|---|---|---|---|---|
| | ¼", & over are plates | | | | | |
| 7 | .1793 | 7.500 | .... | .... | .... | .... |
| 8 | .1644 | 6.875 | .... | .... | .... | .... |
| 9 | .1494 | 6.250 | .... | .... | .... | .... |
| 10 | .1345 | 5.625 | 5.7812 | .140625 | 5.7937 | 5.9062 |
| 11 | .1196 | 5.000 | 5.1562 | .125000 | 5.1500 | 5.2500 |
| 12 | .1046 | 4.375 | 4.5312 | .109375 | 4.5063 | 4.5937 |
| 13 | .0897 | 3.750 | 3.9062 | .093750 | 3.8625 | 3.9375 |
| 14 | .0747 | 3.125 | 3.2812 | .078125 | 3.2187 | 3.2812 |
| 15 | .0673 | 2.812 | 2.9687 | .070312 | 2.8968 | 2.9531 |
| 16 | .0598 | 2.500 | 2.6562 | .062500 | 2.5750 | 2.6250 |
| 17 | .0538 | 2.250 | 2.4062 | .056250 | 2.3175 | 2.3625 |
| 18 | .0478 | 2.000 | 2.1562 | .050000 | 2.0600 | 2.1000 |
| 19 | .0418 | 1.750 | 1.9062 | .043750 | 1.8025 | 1.8375 |
| 20 | .0359 | 1.500 | 1.6562 | .037500 | 1.5450 | 1.5750 |
| 21 | .0329 | 1.375 | 1.5312 | .034375 | 1.4160 | 1.4437 |
| 22 | .0299 | 1.250 | 1.4062 | .031250 | 1.2875 | 1.3125 |
| 23 | .0269 | 1.125 | 1.2812 | .028125 | 1.1587 | 1.1813 |
| 24 | .0239 | 1.000 | 1.1562 | .025000 | 1.0300 | 1.0500 |
| 25 | .0209 | .875 | 1.0312 | .021875 | .9013 | .9187 |
| 26 | .0179 | .750 | .9062 | .018750 | .7725 | .7875 |
| 27 | .0164 | .6875 | .8437 | .017187 | .7081 | .7218 |
| 28 | .0149 | .625 | .7812 | .015625 | .6438 | .6562 |
| 29 | .0135 | .5625 | .7187 | .014062 | .5794 | .5906 |
| 30 | .0120 | .500 | .6562 | .012500 | .5150 | .5250 |

Orders for sheets specified by gauge weight or thickness are subject to standard gauge weight or thickness tolerances. These tolerances apply equally plus and minus from the gauge weight or thickness.

U.S. Standard Gauge (U.S.S.) for Iron and Steel sheets was established by Act of Congress in 1893, in which it was specified that weights per square foot would be indicated by gauge number. The weight, not thickness, is the determining factor when sheets are ordered to this gauge.

The Galvanized Sheet Gauge, established by custom, is based on the U.S. Standard Gauge. Each Galvanized Sheet Gauge weighs 2.5 oz. per sq. foot more than the same U.S. Standard Gauge, regardless of coating weights.

## STEEL WIRE GAUGES and DECIMAL EQUIVALENTS

| Ga. No. | Birmingham Wire Gauge or Stubs Ga. Thickness, In. | Birmingham Wire Gauge or Stubs Ga. *Wt. per Sq. Ft. | Brown & Sharpe or American Wire | Steel Wire Gauge (Washburn & Moen) |
|---|---|---|---|---|
| 3 | .259 | 10.567 | .2294 | .2437 |
| 4 | .238 | 9.710 | .2043 | .2253 |
| 5 | .220 | 8.976 | .1819 | .2070 |
| 6 | .203 | 8.282 | .1620 | .1920 |
| 7 | .180 | 7.344 | .1443 | .1770 |
| 8 | .165 | 6.732 | .1285 | .1620 |
| 9 | .148 | 6.038 | .1144 | .1483 |
| 10 | .134 | 5.467 | .1019 | .1350 |
| 11 | .120 | 4.896 | .0907 | .1205 |
| 12 | .109 | 4.447 | .0808 | .1055 |
| 13 | .095 | 3.876 | .0720 | .0915 |
| 14 | .083 | 3.386 | .0641 | .0800 |
| 15 | .072 | 2.938 | .0571 | .0720 |
| 16 | .065 | 2.652 | .0508 | .0625 |
| 17 | .058 | 2.366 | .0453 | .0540 |
| 18 | .049 | 1.999 | .0403 | .0475 |
| 19 | .042 | 1.714 | .0359 | .0410 |
| 20 | .035 | 1.428 | .0320 | .0348 |
| 21 | .032 | 1.306 | .0285 | .0317 |
| 22 | .028 | 1.142 | .0253 | .0286 |
| 23 | .025 | 1.020 | .0226 | .0258 |
| 24 | .022 | .898 | .0201 | .0230 |
| 25 | .020 | .816 | .0179 | .0204 |
| 26 | .018 | .734 | .0159 | .0181 |
| 27 | .016 | .653 | .0142 | .0173 |
| 28 | .014 | .571 | .0126 | .0162 |
| 29 | .013 | .530 | .0113 | .0150 |
| 30 | .012 | .490 | .0100 | .0140 |

*B. W. gauge weights per square foot are theoretical and are based on the steel weight—40.8 lbs. per square foot of 1" thickness.

Birmingham or Stubs Gauge—Cold rolled strip, round edge flat wire, cold rolled spring steel, seamless steel and stainless tubing and boiler tubes.

Steel Wire Gauge (Washburn & Moen Gauge)—Round steel wire in black annealed, bright basic, galvanized, tinned and copper coated.

# Call Ryerson for Fast Delivery

PLANTS DISTRICT OFFICES (■) DIRECT PHONES (●)

## Mid-West

**MILWAUKEE**—500 S. 88th Street. **Mail Address:** Box 534, Milwaukee 1, Wisconsin* **Phone:** Glenview 3-8000 **Teletype:** MI 87

**CHICAGO**—16th & Rockwell Streets **Mail Address:** Box 8000-A, Chicago 80, Ill.* **Phone:** Rockwell 2-2121 **Teletype:** CG 700-701

■ **ROCKFORD**—425 E. State St., Rockford, Ill. Phones: 4-5679, 4-5670.

■ **ROCK ISLAND**—344 1st National Bank Building, Rock Island, Illinois. Phones: Rock Island 6-2627, Rock Island 6-2628.

■ **MINNEAPOLIS**—628 Lumber Exch. Bldg., 5th St. & Hennepin Ave., Minneapolis 1, Minn. Phones: Federal 3-2563, Federal 3-8558.

■ **SOUTH BEND**—Room 412, Platt Bldg., Wayne & Michigan Aves., South Bend, Indiana. Phone: Central 3-2191.

■ **DENVER**—4150 Fox St., Denver 16. Phone: Genesee 3-6453. Teletype DN 416

**INDIANAPOLIS**—6701 E. English Street **Mail Address:** Box 918, Indianapolis 6, Indiana* **Phone:** Fleetwood 9-8282 **Teletype:** IP 95

**DETROIT**—1600 E. Euclid Avenue **Mail Address:** Box 5338, Milw. Jct. Sta., Detroit 11* **Phone:** Trinity 4-3311 **Teletype:** DE 259

**ST. LOUIS**—5 Clinton Street **Mail Address:** Box 527, St. Louis 3, Missouri* **Phone:** Central 1-1020 **Teletype:** SL 83

■ **KANSAS CITY**—Room 314, V.F.W. Bldg., 406 W. 34th St., Kansas City 11, Mo. **Phones:** Valentine 1-1661, Valentine 1-1662.

**CINCINNATI**—3475 Spring Grove Ave. **Mail Address:** Annex Box 300, Cincinnati 14, Ohio* **Phone:** Kirby 1-3241 **Teletype:** CI 297

● **DAYTON**—Phone: Adams 5251, 5252

● **LOUISVILLE, KY.**—Phone: Juniper 3-3849

**CLEVELAND**—5300 Lakeside Ave. **Mail Address:** Box 6208, Cleveland 1, Ohio* **Phone:** Henderson 2-1411 **Teletype:** CV 302

## West

**LOS ANGELES**—4310 E. Bandini Blvd. **Mail Address:** Box 3817, Los Angeles 54, Calif.* **Phone:** Angelus 2-6141 **Teletype:** LA 523

● **SAN DIEGO**—Phone: Belmont 4-7582.

**SAN FRANCISCO**—65th & Hollis Sts., Emeryville **Mail Address:** Box 8188, Emeryville, Calif.* **Phones:** Olympic 3-2933. Direct Line from S. F. to Emeryville, Call Douglas 2-4211 (No inter-city charges). **Teletype:** OA-253

**SEATTLE**—1200 4th Avenue South **Mail Address:** Box 3525, Seattle 24* **Phone:** Seneca 2300 **Teletype:** SE 355

● **TACOMA**—Phone: Market 7-7262

**SPOKANE**—North 207 Freya Street **Mail Address:** Box 2158, Spokane 10* **Phone:** Keystone 5-1581 **Teletype:** SP 111

## East

**NEW YORK**—203 Westside Ave., Jersey City **Mail Address:** Box 484, Jersey City 3, N. J.* **Phones:** New York City—Worth 4-1313, Jersey City—Henderson 4-1123, Newark—Market 4-1111 **Teletype:** J CY 214

**WALLINGFORD, CONN.**—780 N. Colony Rd. **Mail Address:** Box 188, Wallingford, Conn. **Phone:** Colony 9-8744 **Teletype:** Wallingford, Conn. 397

**BOSTON**—60 Everett Street, Allston Dist. **Mail Address:** Box 1111, Boston 3* **Phone:** Stadium 2-6900 **Teletype:** BRTN 846

● **PROVIDENCE**—Phone: Plantation 1-1068

● **WORCESTER**—Phone: Pleasant 4-1837

**PHILADELPHIA**—5200 Grays Avenue **Mail Address:** Box 7349, Philadelphia 1, Pa.* **Phone:** Saratoga 4-0700 **Teletype:** PH 166

● **BALTIMORE**—Phone: Valley 3-5301

**CHARLOTTE**—831 Moretz Ave. **Mail Address:** Box 10006, Charlotte 1, N. C.* **Phone:** Franklin 7-6555

**BUFFALO**—40 Stanley Street **Mail Address:** Box 996, Buffalo 5, New York* **Phone:** Bailey 3311 **Teletype:** BU 87

● **ROCHESTER**—Phone: Baker 5-4980

● **SYRACUSE**—Phone: Granite 8-3296

**PITTSBURGH**—Arch St. and Bell Ave., Carnegie **Mail Address:** Box 1919, Pittsburgh 30, Pa.* **Phones:** Walnut 1-7540, Browning 9-0900 **Teletype:** Carnegie, Pa. 666

***FAST MAIL SERVICE:** Hourly pick-up from Post Office Box

**JOSEPH T. RYERSON & SON, INC.**

1957–1958

# Ryerson Steel

ALUMINUM & STEEL IN STOCK

Phone: GLenview 3-8000

JOSEPH T. RYERSON & SON INC.